

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

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The Trade Association's Future

UNDER the caption "The To-morrow of Trade Associations" the National Association of Manufacturers succinctly summarizes the situation in this field by saying: "Business looks upon associations as a luxury and supports them mainly when trade prospers. Associations have a quite different appraisal of themselves and are now striving to prove that worth to business. The war crop of associations was the largest of record—amazingly large. The weeding out process has begun. The stalwart and necessary are sharing the uncertainty and the danger of the superfluous. The associations' struggle to live matches the indifference of the business man to them when money is tight.

"Meanwhile as industry becomes more complex and as competition flourishes the business man feels a keen need to cuddle closer to his competitors for safety. The only vehicle for the necessary action appears to be the association, since more intimate forms of contact are taboo. This tendency of business to approach co-operation through the association arouses the government to discuss the trade association. The Department of Commerce, built to encourage business, wants to develop the best in the various associations. Mr. Hoover expressed it when he said that the more intense industrialization of the country resulted automatically in specialization, and specialization leads to associations of specialists. The Department of Justice cannot frown upon this movement, but must keep a watchful eye lest these centralizing movements end in restraint of trade.

"The business men, encouraged to co-operate but forbidden to combine, whirl around in a circle when asked to draw a line of association action which co-operates to the limit without combining. Because of this confusion, resulting from a disposition to lean toward associations, and from fear to take action through associations, the latter have entered a new era of uncertainty which threatens their existence. This raises the question as to what we are to do with these associations in future."

This states the case as respects the coal industry. Local trade associations and the national associations of producers, jobbers and retailers are largely a growth of the war and post-war periods. No one questioned and no one now questions their necessity and value from the early part of 1917 to the peak of 1920. But with the coming of deflation and the keen searching of the public mind into the propriety of the activities of trade groups in some lines of industry, together with the questioning of all by the Department of Justice, there has arisen in the coal industry a hesitancy barring progress and disconcerting loyal hearts.

Now is the time to take hold with a will. Give heed to the needs of the industry locally and nationally; inoculate the officers with a spirit of progress—if it doesn't "take," try someone else—and get busy on a

program of developing your association to meet the problems of today, which are not the problems of yesterday.

Counteract Loose Thinking

IN SO FAR as public opinion is concerned—a matter of some importance—the bituminous coal operators are in a precarious tactical position in the present labor crisis. General unwillingness and even active opposition to the resumption of negotiations in the interstate conference on the part of the Central Competitive Field operators and the avowal of a majority of the outlying fields to settle their scales independent of whatever settlement may be reached in that historic basing district has given rise to popular feeling that the operators are opposing any wage negotiations with the union and that they are set upon its destruction. The miners' union has not been slow to seize the opportunity to strengthen its standing with the public by fostering this idea.

The direction some of this thinking is taking is indicated by an editorial in the *New York Evening Post* last week. It says in part: "If many operators really think that now is the time to smash the union, the public and the government can help disabuse them. We would welcome a vigorous direct statement from President Harding that the operators ought to go into a general interstate conference." The paper that says this is not a yellow journal. It is one of the most conservative. So far as we know, this paper has never said that the railroad executives were trying to wreck the railroad unions because they are making a drive for regional settlements with their men rather than national agreements. The case is not greatly different with coal.

It would seem to be a fair assumption that were the *Evening Post* and others as well informed with respect to the facts and arguments of the coal operators in the Central field for desiring local negotiations and settlements with their men, rather than a national contract, as they are with the circumstances governing the actions and intentions of the railroad managers, such loose opinion as that quoted above would not be found in such usually responsible quarters. It happens, however, that but one local field, Illinois, has as yet taken the pains to take the public into its confidence. In other words, we suspect that it is not so much that Pittsburgh and southern Ohio have declined to enter a Central Competitive Field meeting as the fact that they have until the last few days merely so stated and considered the matter closed that has fostered the lack of understanding of their position.

It is not that these operators have not proper motives, that they cannot maintain their position by facts, but that they have not as yet met the situation with ade-

quate publicity. Doubtless it is this that is responsible for the concluding sentence of the *Evening Post* editorial to which we have referred, which is as follows: "The public would be equally glad to see Congress pursue Representative Newton's suggestion that it is high time we were provided with full and constant information regarding production, consumption, costs and prices in this colossally inefficient industry." Note the closing stricture. We resent it because it is unwarranted. It is, however, typical. What grieves us is the indifference of so many in the coal industry to statements such as this; refusal to recognize that if it be repeated often enough, the world will accept it as the truth and not the half truth it actually is.

Deflation the Real Issue

PLAINLY enough the real issue in the approaching crisis in the affairs of union coal-mine labor is being befogged. The real issue is whether union wage rates shall be deflated. Events of the past few weeks have been such as to make it appear that the issue is something else—namely, whether the United Mine Workers shall succeed in having a new wage contract negotiated first by a Central Competitive Field conference and subsequently by the outlying fields.

Lewis and Farrington know, as well as do the operators, that in a matter of reductions the miners' interests lie in the continuance of the basic field negotiations. The operators, determined to make a job of it and get costs down to a competitive basis approaching that in non-union fields, have adopted the opposite course; they are asking that the miners' union in each state or field meet the operators of that field, just as the anthracite miners and producers are already in conference.

It may be, as pointed out in our Washington dispatch this week, that the leaders of the union miners "know that the strike is a necessary step before the rank and file in the union develops a psychology sufficiently plastic to consider the question [of a reduction] rationally." What the Washington observers, whose opinion our Washington correspondent reflects, are overlooking is that the interstate method of negotiating is unsuitable as a vehicle for the deflation operation. Quite true it is that there must eventually be equilibrium in wages and costs between the various union fields else we have a highly unstable industry—but do not forget that now the greatest distortion is in the lack of comparability between union and non-union wage scales. To remedy that is the first step and the one we are facing now. The proper balance between union fields can and will be realized later.

To all of this abracadabra about the bituminous operators violating their solemn contract of 1920 to resume prior to April 1, 1922, Central field negotiations we can but reiterate that it is a technicality, for the miners tore the contract up within five months of its signing and themselves reverted to state settlements in August, 1920, to gain a larger advance in day wages than awarded them by the President's commission.

As Secretary of the Department of Labor, Mr. Davis is doing the customary thing when he calls on the operators to meet the miners—in the way the miners want to meet. Something more definite must be forthcoming before we will be convinced that the activities of Secretary Davis so far represent the attitude of the administration.

Improved Practices in 1922

LABOR IS conservative. Every man wants to be more than sure of his full wage and is opposed to any change in methods of operation unless he is convinced that it will greatly benefit him. Labor also is apt to be greedy. The miner would have the operator put in expensive machinery, experiment with it, furnish power for it, maintain it, repair it, yet give the workman all the benefit accruing from its use.

When the laborer is in the ascendant he opposes change. Now that all conditions are propitious it would be extremely foolish not to make a supreme effort to introduce at a somewhat reduced scale per ton machinery that will lighten labor and increase output. The arc-wall machine is a case in point. An arc-wall price should be established. The labor and the time of prying a machine into place is saved by using this form of coal cutter. When it is installed the cutter and scraper are greatly benefited, and they should be willing to make its entry into the field profitable to the operator as well as to themselves.

Where jackhammers and other air drills are supplied free and even where only the power and piping for their operation are furnished, consideration for these items should be made in the tonnage scale. One of the most grueling parts of mining is the drilling of roof, floor or coal. The operator who supplies the wherewithal to make the drilling easy should share with the miner the profit that such machinery makes possible.

Labor will give no service to capital without reward. Why then should the capitalist expend money to help labor without appropriate return? What is true of the jackhammer also is true of the electric drill and of the electric current and wiring that are provided for the driving of such machinery.

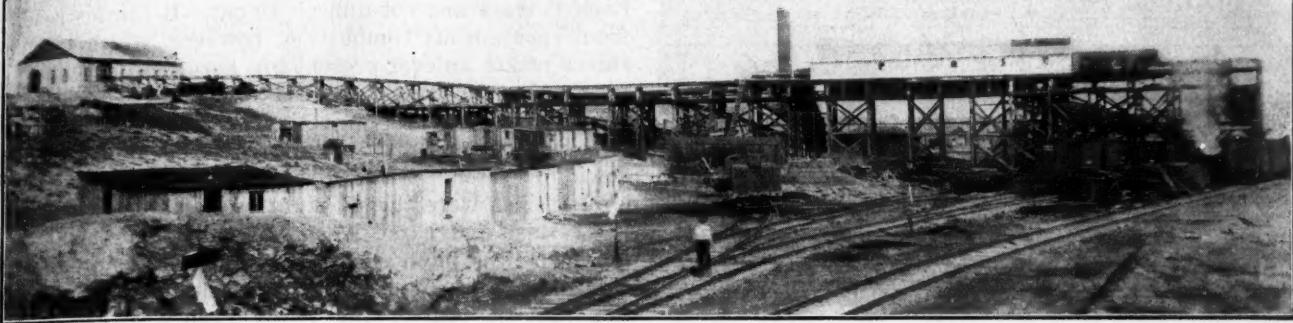
A differential should be given also for longwall cutting. No one should be deprived of a reward for enterprise or effort. To deny such a reward is no more nor less than Bolshevism. We have seen how deprivation of all returns to outlays of capital and expenditures of labor has strangled Russia.

Either the equal turn must be abolished altogether or an increased turn must be given to those who, by using electric drills, jackhammers or working by longwall methods, have their ability to produce increased and their rate of compensation per unit of production decreased.

The introduction of improved machinery should be accompanied by improved supervision of men, machines and power supply. To buy machinery and leave it to its own devices is an ill-advised expenditure. Labor is none too friendly to new equipment, and the power available is none too adequate for increased demand. In consequence when a new machine is introduced someone should be employed to make its operation successful and to see that its ability to produce is not limited by a shortage of power, cars, wiring or repairs.

Only the other day a manufacturer went to a mine to see why his machine was not being used. He induced the management to have it operated under his supervision. He found the man who was to run it had no wrench and as he needed one he sent him out to get it. After an hour the man returned. He had the wrench. The bolt was turned and the man left. The wrench was only borrowed. He must return it, and another hour was lost. No wonder the machine was not proving a profitable acquisition.

Owl Creek Coal Co., at Gebo, Wyoming, Mines Steeply Pitching Bed by Rooms Driven on the Strike



A Pitch Too Flat to Permit Sliding Yet Too Steep for Easy Car Movement and Coal That Ignites Readily by Spontaneous Combustion Are Among Obstacles Overcome at This Operation

BY C. M. SCHLOSS
Denver, Colo.

THE Gebo mine of the Owl Creek Coal Co., in the valley of the Big Horn River in that part of its course in which it travels through the State of Wyoming, is located on a north and south branch of the Chicago, Burlington & Quincy R.R. about 500 miles north of Denver and 200 miles south of Billings, Mont. Though of moderate size in comparison with some of the collieries in the Eastern coal fields of the United States, the plant is of interest because of the means employed in mining the seam, which lies on a heavy grade. Another detail of unusual interest is the provision made for loading box cars at the tipple.

Wyoming has a large area and a sparse population. No factories or other industrial plants of any appreciable size have been established within its boundaries other than a few oil refineries and beet-root sugar mills. The former burn natural gas as fuel, and the latter operate only from September to January. Thus the local demand for fuel is small, and the coal mined at Gebo has to be shipped long distances. In order to prevent the coal from deteriorating from exposure to the weather, as well as to avoid certain other losses incident to long railroad hauls, most of the lump and nut coal is shipped in box cars.

Shoveling coal from the side door of a box car to the end by hand would be so expensive as to be prohibitive. Four men would be needed to each car. Accordingly four Manierre box-car loaders have been installed. Two of these are of the steel-apron type and are used for handling lump coal. The other two are of similar construction but employ endless rubber belts and are used for handling nut coal.

The shaking screen installed in the tipple is provided with several gates, making it possible to load slack on track 1 either in open or in box cars; pea or nut in open cars on track 2; nut or lump in open cars or lump in box cars on track 3, and lump in open or box cars on track 4. The flexibility of operation thus obtained

obviates the necessity of stopping the screen when shifting cars.

Slack is loaded into box cars on track 1 or pea into similar cars on track 2 through flexible spouts. Box-car loaders are not provided for these sizes. When it is necessary, pea can be loaded by means of box-car loaders with the aid of the pea conveyor. Nut can be loaded in box cars on track 2 or 3. A gate in the screen discharges this size onto a steel apron conveyor 30 in. wide extending between these two tracks. Pickers are stationed upon either side of this apron, which carries the nut to the two-way chute as shown in Fig. 2. This delivers the material to either track, as required.

Extra long arms are provided for one of the nut and one of the lump loaders. This provision, which is

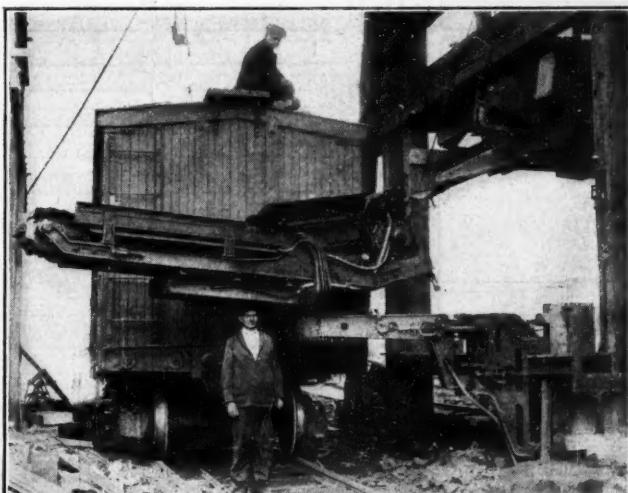


FIG. 1. FOUR BOX-CAR LOADERS USED AT TIPPLE
This is one of the two loaders of the steel-apron type which are used for loading lump coal. For nut coal endless rubber belts are used and when the belts wear they are "shingled" with short pieces of belt by the aid of flat-headed elevator bolts.

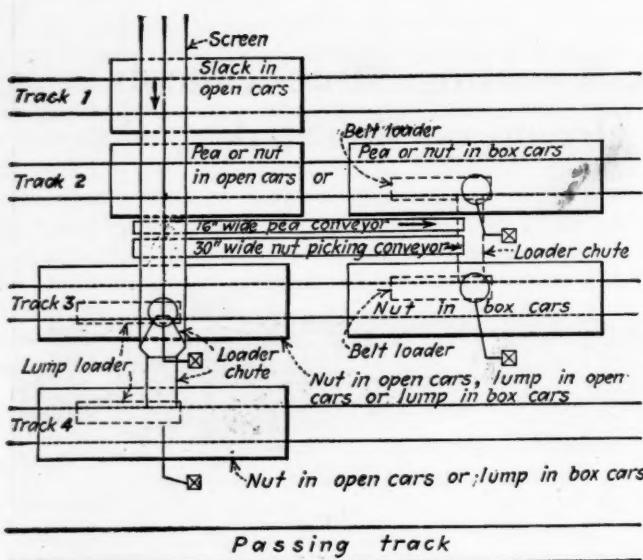


FIG. 2. SCHEMATIC PLAN OF TIPPLE PLANT
The product of the mine enters the tipple on the left, following the direction of the arrow. It then is screened and the smaller sizes loaded into open cars. If desired, however, pea and nut are taken to box car loaders by a conveyor and loader chute and placed in box cars, the nut being picked on the way. The lump continues on to a point over tracks 3 and 4, where it is separated and run to box-car loaders. Into open cars on these two tracks nut coal can be loaded if desired.

not unusual, is made necessary by the insufficiency of room between the tracks to accommodate two loaders which, if installed, would be placed opposite the chute and across the tracks.

The officials of the coal company have devised an interesting method whereby the life of the rubber belts used on the box-car loaders may be lengthened. When these belts begin to show wear they are "shingled" with short pieces of old belt. Each shingle is held by four flat-headed elevator bolts. These bolts are equally spaced across the width of the belt and set 1 in. from the edge of the shingle. The shingles, of course, overlap yet are separate and can be replaced easily. They relieve the belt of much of the wear and of practically all of the abrasion resulting from handling the coal.

The bed worked at Gebo pitches at an angle of 20

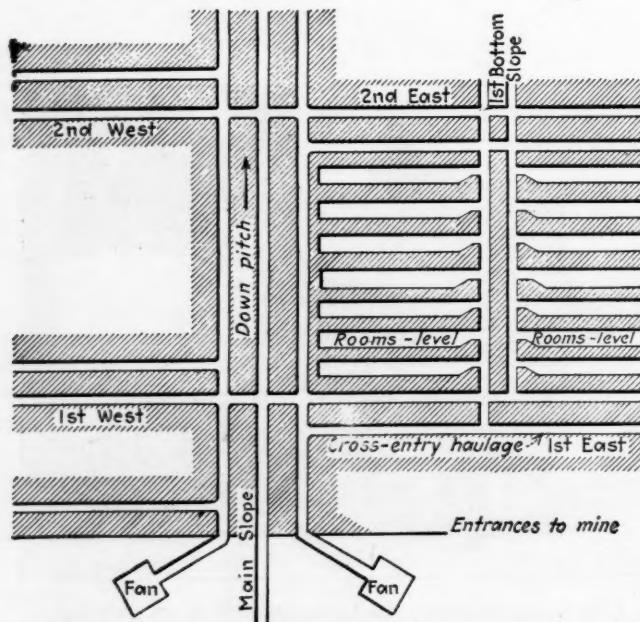


FIG. 3. METHOD OF MINING ON THE STRIKE
This has replaced the old method in which the rooms went up the pitch, which was heavy enough to occasion much trouble but not sufficiently steep so that coal would run in steel-plate chutes.

to 21 deg. Fig. 7 is an illustration made from a photograph taken in one of the rooms just after shots had been fired. It gives an excellent idea of the way in which the coal comes down. In the deepest part of the mine the overburden is 800 ft. thick. The cleavage planes of the coal extend at an angle of 45 deg. to the pitch, and the bed varies in thickness from 5 or 6 ft. at the outcrop to 10 ft. in the lowest level. The coal itself is clean and not difficult to cut. It ignites readily from spontaneous combustion, however, which circumstance makes an ever-present fire hazard which must be carefully watched and guarded against.

Fig. 3 is a partial projection of the workings. The mine was developed by driving three openings straight down the pitch. Some distance downward a pair of level entries were turned right and left, known as the First East and First West. From these rooms were driven up the pitch and chute mining attempted, with only indifferent success. The grade is not steep enough to permit the coal to slide freely, even when the chutes are lined with sheet iron.

When the present mine foreman entered the employ of this company, he had much difficulty in persuading the management to experiment with what has developed

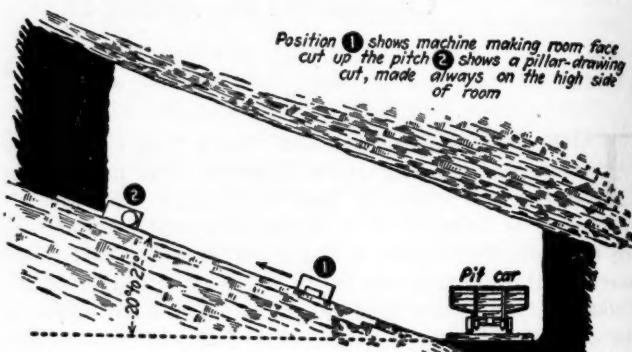


FIG. 4. POSITION OF MACHINE MAKING FACE CUT AND PILLAR CUT

Despite the grade of 20 to 21 deg., or 36 to 38 per cent, the machines are without difficulty kept in place, especially when the bits are allowed to become a trifle dull.

into the system of mining now followed. This method of operation proved a success from the start and has been extended throughout the entire operation.

Six pairs of cross entries have been turned to the right and left off the main slope. The distance between pairs varies from 225 ft. near the surface to 800 ft. in the deepest portion of the operation. Instead of turning chute rooms from these entries, as was formerly attempted, butt slopes are driven down the pitch at intervals of 650 ft., connecting the various levels.

Rooms 22 ft. wide and 300 ft. long are turned off the butt slopes on both sides. These rooms are driven practically level. Thus the rooms from adjacent butt slopes would eventually meet, but they are stopped before this occurs and a pillar 50 ft. thick is left between the faces of the two ranges of rooms. This will prevent the air from circulating from one range of rooms to another should a fire start. The coal in these pillars is left permanently and is, of course, lost when the section is finally sealed off. The upper panels contain seven to eight rooms, and the lower ones eight to eleven.

The coal is undercut to a depth of 6 ft. by standard Goodman shortwall machines, both alternating- and direct-current types being used. In advancing the room faces, cutting may be done either up or down the pitch.

Fig. 6 illustrates the machine being maneuvered into position to make its sumping cut on the high side of the room. Fig. 4 shows the position of the machine when slabbing pillars, cutting breakthroughs and when moving across the face up the pitch. The first two of these operations are made on the high sides of the rooms but the machines can perform any of the three without difficulty. In fact it is remarkable to see how easily they can be handled under conditions so trying.

In order to keep the cutter bars completely under the coal when working up the pitch it has been found necessary to place jack pipes close to the machine and to use dull cutter bits. The friction of the dull bits naturally exerts a reaction upon the machine. On the butt entries the machines are raised or lowered by means of hoists, the pitch being so steep that they cannot ascend or descend under their own power. For driving slopes a breast machine has been mounted on a mine truck about 18 in. above the rails. This device was made necessary by reason of the accumulation of water in the low places.

A 2,000-hp. cylindrical-drum steam hoist, equipped

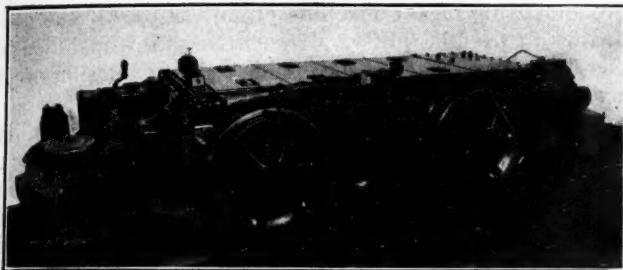


FIG. 5. INSIDE-FRAME TWO-MOTOR TROLLEY LOCOMOTIVE

This is used for haulage on the cross entries. It is a 6-ton machine, hauling to the main slopes 45 to 50 cars.

with a 1½-in. steel cable, hauls the cars on the slope. These cars weigh 2,500 lb. empty and 7,500 lb. loaded. Ten of them constitute a trip, and 80 to 90 trips are made per 8-hour day. The rope speed is quite fast, averaging about 2,000 ft. per minute.

Four 6-ton Goodman two-motor inside-frame locomotives are used for haulage on the cross entries. One of these is shown in Fig. 5. They haul to the main slope trips of from 45 to 50 cars, taking them from

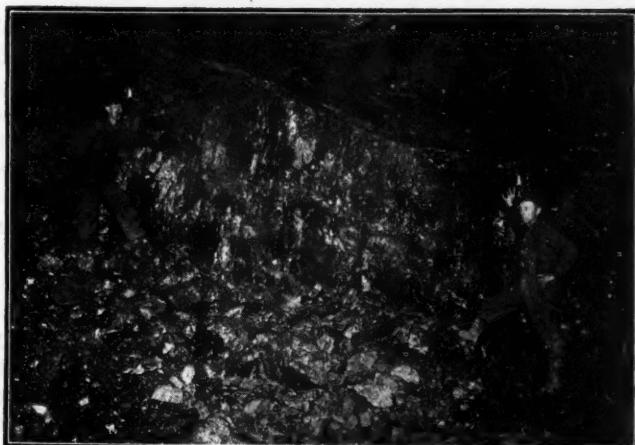


FIG. 7. FACE OF A ROOM DRIVEN ALONG THE STRIKE
A shot has just been fired and has not been cleaned up. The coal has a dip of from 20 to 21 deg. and measures from 5 to 10 ft. It is a sub-bituminous coal.

the various partings on the cross entries, which in places are as much as 3,000 ft. in length. The inside-frame type was preferred because the brakes are easy of access and the machines can readily be replaced when they leave the track. As may be seen in Fig. 5, they are equipped with spring bumpers and draft gear. This provision saves the cars from much violence, reduces the spillage of coal, decreases crystallization in the car hitchings and spares the motorman from many shocks and jars.

Direct current for operation of the locomotives and mining machines is supplied by one Ridgway synchronous and one General Electric induction motor-generator set. The former is of 200-kw. and the latter of 100-kw. capacity. These machines are located at different points underground. At the heads of the stub slopes 50-hp. hoists are placed. These gather the loads from the room necks, replacing them later by empties. The miners move the cars by hand from the necks to the room faces and when they are loaded push them back to the slope.

The slack which collects on the tipple and the refuse from the picking table are disposed of in an unusual manner. The tipple stands immediately over the main slope and to the latter two round holes have been sunk.

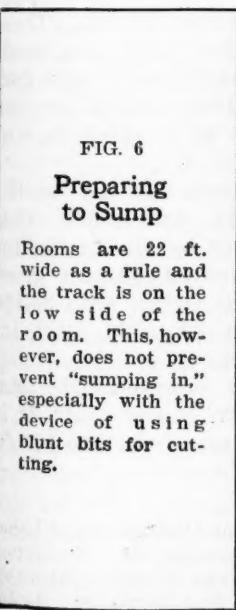
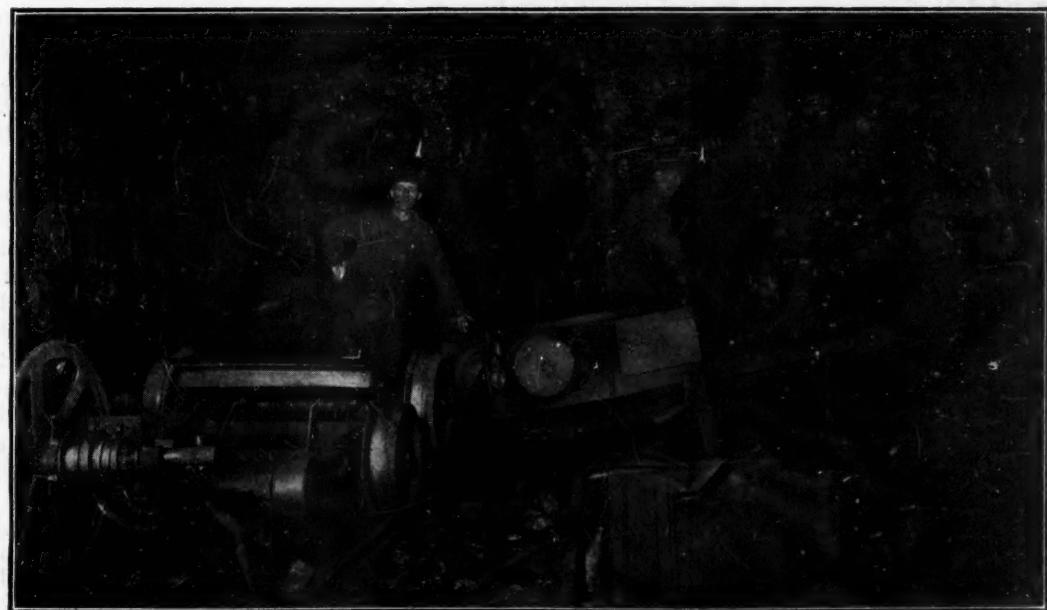


FIG. 6

Preparing to Sump

Rooms are 22 ft. wide as a rule and the track is on the low side of the room. This, however, does not prevent "sumping in," especially with the device of using blunt bits for cutting.



These have been lined with concrete and supplied with gates on the bottom and hoppers at the top. The slack is swept into one opening, and the refuse is thrown into the other. After working hours, if the holes have filled up, cars are lowered underneath them, the gates opened and the holes emptied. The refuse is hauled to the surface to be disposed of by the usual means, and the slack is sent through the tipple, as is other coal from the mine.

"Owl Creek" is a high grade of sub-bituminous coal believed to be the equal of any similar fuel produced in the West. The Gebo mine as a rule works steadily throughout both winter and summer. This is an unusual condition, as many properties in this region are winter producers only. These are sometimes sarcastically referred to as "snow birds."

Conference on Mine Cables Would Condition Permissibility on Frequent Inspection

TRAILING electrical cables for use on mining machines formed the basis of a conference recently held at the Pittsburgh Experiment Station of the U. S. Bureau of Mines. Cable and mining-machine manufacturers, coal operators and Bureau of Mines engineers were in attendance. Some of the salient features of the proceedings were as follows:

Cables as at present constructed were deemed adequate in capacity by machine manufacturers while the cable manufacturers seemed to think that their size should be increased. Operators experience little trouble on 500-volt circuits where the cables are protected by fuses. Conductors of small diameter are necessary in order that they may be handled easily and reeled properly. Furthermore small conductors may be safeguarded by a requirement that the voltage of machine circuits shall not fall below predetermined values.

Cable manufacturers stated that cables up to No. 4 size are now made with 49 and larger sizes with 133 wires. Machine builders do not get out specifications for cables but merely ask makers of such equipment for a suitable flexible cable of a certain capacity.

For mine service a better grade of insulation than that specified by code requirements was believed necessary by the cable manufacturers, who are now working on a set of standards. In the past competition has been keen and in many instances insulation of an inferior quality has been furnished. Conductors having an outer covering of rubber of a quality similar to that used in the treads of automobile tires have been tested by the Jeffrey Co., and are strongly advocated by this firm. It is believed that this construction greatly adds to the safety of machine operation, as such cables are more likely to withstand being run over by a locomotive without severance, which would cause arcing. All cable manufacturers can make this type of cable if trade conditions warrant such a procedure.

If possible, mining machine cables should be "non-kinkable." The old type of twin cables kinks badly. Concentric cables give little trouble from this cause. It is possible to use a twin cable, employing rubber insulation that is said to be non-kinking. Twisted duplex cables, while enjoying immunity from kinking, generally are large and unwieldy for machine service.

It was the consensus of opinion that the Bureau of Mines should continue to require the use of satisfactorily insulated handles or some other means of connecting machine cables to the source of power supply not involv-

ing a personal hazard to the one making the connection. At all points where gas is likely to be encountered, interlocking switches should be used. At present no suitable switches of this type are on the market. The operator is ready to purchase them and the state mining departments probably would enforce their use were they available. Both fusible and non-fusible switches should be developed. The Bureau of Mines will continue to require proper protection of the machine end of all cables, as prescribed in Schedule 2-B.

One operator now protects nearly all his machines from short-circuits by means of a fuse at the end of the trailing cable where it connects with the power circuit. These fuses are placed in the handles attached to the outer end of the trailing cable and are made explosion proof. They are said to be used only on intake air. The opinion prevailed at the conference that all trailing cables should be fuse protected either where the cable joins the power circuit or at some point within that circuit that would afford adequate protection. The opinion also prevailed that the Bureau of Mines should require protection of the trailing cable by means of proper fusing of the machine circuit as one of the conditions of permissibility. If such fuses are installed in gaseous places they should be housed in explosion-proof compartments.

It was the sense of the conference that permissibility should be made conditional upon frequent inspection. Renewals should be made with the same quality of cable as was originally approved. A list of cables approved for new installations or for renewals doubtless will be worked out later.

All manufacturers of approved equipment agreed to furnish the Bureau of Mines on request with a list of the companies purchasing approved machines of their manufacture. The bureau will then be in a position to advise these machine owners from time to time of any steps that may be taken to increase their safety.

Big Outputs! Has Any Shaft Done Better?

OUR recent inquiry about production records has received an apparently satisfactory answer from Frank J. Smith, of the Chicago, Wilmington & Franklin Coal Co., of Chicago. Mr. Smith sends us a circular of the company telling of three production records made by its Orient mine in Franklin County, Illinois. These are as follows: Record for one day, 6,777 tons, made on March 6, 1919; for one week, 34,792 tons, made during the week of Oct. 24 to 29, 1921; record for one month, 144,576 tons, made in the 26 working days of October, 1921.

These are given in each instance as the world's record for any single mine up to the date given. That they are not unbeatable is admitted by Mr. Smith, for he states that the weekly record of 34,792 tons given above has already been bettered by Orient with 36,185 tons produced in the week of Jan. 24 to 30, 1922, inclusive. Can any one else do better?

[The daily record here set forth represents the total extraction of over $\frac{1}{2}$ acre of a 5-ft. bed of coal. It is recorded that the bed at Orient ranges from 8 to $10\frac{1}{2}$ ft. in thickness.—EDITOR.]

THE BUREAU OF CONCILIATION of the Department of Labor has practically completed its compilation of information concerning coal wages and conditions in the coal fields which has been conducted since the first of the year under Hywel Davis, one of the conciliators.

Selection of Most Suitable Coal for a Given Plant Is Engineering Problem Involving Diverse Factors*

Fuels Available, Equipment, Character of Load and Service, Labor, Available Space and Real Estate Values Must Be Considered—Uniformity Chief Quality to Be Sought—Equipment Should Be Adapted to Coal Used

BY O. P. HOOD†
Exclusive to *Coal Age*

THE art of buying presupposes a need to be filled. The need must be as clearly defined as may be in order that one may know whether the purchase is really satisfactory. A certain kind of satisfaction can be obtained if one is comfortably ignorant of just what is wanted. Another kind of satisfaction also may be had from the knowledge that we are following conventional lines and doing what everybody else does, which must, therefore, be the proper thing. However, when a body of men make a business of purchasing, it is to be expected that their art has been carried far beyond these elementary stages, and that whether the article to be purchased be pins, pickles or periscopes, a careful investigation will be made of the need to be filled and the fitness of the offered article to fill that need.

Coal usually is purchased to produce heat by means of the addition of human labor requiring wages, and the aid of certain devices involving fixed capital and maintenance. The desire usually is to produce a unit of output for the least over-all expense. The problem thus stated immediately presents itself as a complicated one, involving human factors and a phase of engineering construction and practice.

HOW SOME PURCHASING AGENTS BUY COAL

If the purchasing officer knows it all he probably will proceed to buy just coal, satisfied with certain concessions in price obtained in a contest of wits with a keen selling agent who knows his every failing. If the purchasing agent's long suit is heavy hardware and machinery, and he will admit that he knows very little about coal, he probably will lean heavily for advice either on the coal salesman or the man in the boiler room firing the coal. If he gets hold of the best of the coal men, it is probable that he will receive as good service in normal times as he can expect to get in this world of imperfection. But let me hasten to add that there are a great many coal salesmen that do not belong to this select and restricted class. If our purchaser depends upon word from the boiler room he is apt to get excellent advice from the standpoint of reducing the human labor factor to a comfortable minimum, but usually the other factors of unit-output cost are not available to the adviser. Between the average coal man and the average boiler room it probably is safest to follow the boiler room, but neither course will satisfy a real purchasing agent intent on rational purchase methods.

It is no wonder that the problem of coal purchase is a troublesome one. Coal occupies an extended portion of a series of things that begin on the one hand with gas and oils and end on the other with diamonds. The difference between successive products in the series may be small but complex. If you live in North Dakota you

mine a coal that is dry in appearance but is composed of one-third water. If you mine in Rhode Island you get a fuel and a furnace refractory in the same seam, and they look much alike. If you buy when competition is keen and labor relations are good, you get 6 per cent of ash, and when the whole machine is in reverse you get 16 per cent or go without. With these wide variables to contend with it is no wonder that complacency in buying coal goes only with a comfortable amount of ignorance.

The proper selection of the type of coal for a given plant really is an engineering problem, involving available fuels, equipment, character of load and service, labor, available space, real estate values and a multitude of factors which no purchasing agent should attempt to decide unaided. There should be advice from some source that has included all of these factors in a careful analytical study that ends in a statement of over-all costs. It is surprising how little of this is done. In the great industries such as electric utilities, where 60 or 70 per cent of the total costs of output are for coal, there is a lively appreciation of the problem, but in the general manufacturing business there is much room for improvement in coal choosing practice. Whatever the method of arriving at the type of coal to be used, whether anthracite or bituminous, high or low volatile, run-of-mine or screened, the most important quality to be sought for the sake of efficient use is that of uniformity. From an engineering standpoint good results can be obtained, whatever the fuel, by careful adaptation of equipment and practice in each case. If it is necessary or desirable to use coal with 20 per cent ash, of a clinkering quality, equipment can be provided to use it, but it is disastrous to economy to expect to use such coal in equipment planned for rapid burning of low-ash coal.

EQUIPMENT MUST BE ADAPTED TO FUEL CHOSEN

The State of Brazil, S. A., unfortunately has only high-ash coal. Suitable arrangements are made there for its use, but when high-ash coal was supplied to our industries during the war, the wheels of production were dangerously clogged. Equipment was not adapted to it. It requires combustion space in the ratio of 3.2 for low-volatile Eastern coal, 3.9 for Pittsburgh coal, and 5.8 for Illinois coal. The fixed carbon of any coal is burned on the grate, while the volatile matter is burned in the space above the grate. Evidently, a plant adapted to one fuel may be ill adapted to another.

The human factor also balks at change and becomes less efficient, requiring careful handling and direction to become adapted to something different. During the war a cargo of pool 1 coal from Lambert's Point was sent to Finland. It was good coal, but characteristically friable, and our Finnish friends insisted that it was dirt, although admitting that the heating value was in

*Based on an address to the New York chapter, National Association of Purchasing Agents, Feb. 21.

†Chief mechanical engineer, U. S. Bureau of Mines.

the coal. They were used to a blocky coal of poorer intrinsic value, and failed at first to get good results from a better coal of unfamiliar characteristics.

For efficient operation, therefore, uniformity of quality is quite as important as absolute quality. In a well-equipped station capable of running at high rates of combustion and depended upon to meet peak loads, a few cars of different coal having a lower ash-fusing temperature may put the plant out of business at a critical moment, whereas had that quality been constantly in use, rates of combustion would have been kept lower and the peaks met with added boiler capacity.

This question of uniformity of quality, be it good or bad, is of far more importance for economy than usually is recognized. Our coal selling and distributing mechanism is not well adapted to insure uniformity of quality. Coal dealers handling the coal, perhaps, from many mines, and never handling anything but good coal, of course, see no harm in borrowing and lending coal among themselves or shipping according to convenience from any one of a number of mines. In fact, the complexity of modern coal distribution almost demands such practice in times of large demand, as was illustrated by the pooling system.

IMPORTANCE OF UNIFORMITY IN POOLING COAL

Of late the question of uniformity has taken an interesting turn. When we began to export considerable coal a serious difficulty in transportation arose from the necessary delay of cars and clogging of terminals while sufficient coal could be accumulated from the mines of any one dealer to fill a ship. During this accumulation, coal of similar, or it might be identical, nature was being accumulated by some other dealer at the same pier. What more natural than to borrow and lend this coal, to the mutual advantage of both dealers, and thus expedite both rail and vessel shipment? The orderly conduct of this borrowing and lending produced the pooling system and the coal exchanges. If the coal thus borrowed and lent was of closely similar quality the customer also reaped an advantage in the matter, because of the expedited service. There were, however, practically no standards that would automatically determine which coals might, with reasonable justice to the consumer, be thus exchanged. The nearest approach to a standard is what is known as navy coal, but navy coal is only supposed to be the best coal to be had from a given district and from mines meeting certain requirements. It cannot be said to have analytical limits. Navy coal from one district is different from navy coal from another district.

Coal classification, therefore, was largely a matter of opinion of coal dealers, and the users had practically nothing to say in the matter. As a war measure it worked. With a restricted market the plan went to pieces, one potent factor being a lack of reasonable uniformity of quality in any one pool. The underlying idea, however, is right, and with proper classification would be a real help to all purchasers. When one exchange resolved to base its classification on analysis, publish the analytical limits of each class or pool, and provide effective mechanism to discover the facts and keep the pools clean within the specified limits, the Bureau of Mines was glad to lend its aid and support as being a step in advance and of national importance. Beginning last April, the Sewalls Point Coal Exchange operated under this plan, sending some of its coal to New England.

And now the psychology of the purchasing agent appears. The coal salesman was no longer able to claim that his coal was better than the other fellow's, and back it up with the usual arguments that had been potent in the past. His special selling ability was reduced to that of selling Fords or other standardized products. He made representations to the effect that if the curse of a standard analytical limit could be removed he could get 10c. a ton more for the same coal. And I am inclined to think that he could. Such is the state of the coal business.

I am told that being freed from the pool system, the seller represented that his cargo of coal was from one mine, and that the best in the pool, and that therefore greater uniformity of product would be assured. The cargo was followed through and found to be made up of coal from several mines, as before, but there was no check on the mines delivering, as there had been under the pool. Here is a case where the value of uniformity is recognized by promising to replace sufficient uniformity with super-uniformity, but with a result of less uniformity at an advance in price.

What is there that a purchaser can tie to in troubled waters of this sort? The essence of a good business bargain is an exchange where both parties profit and are satisfied. Satisfaction comes from receiving what you expect to get. Dissatisfaction comes from receiving something less than you had a right to expect. When you have found a type of coal supposed to be suitable for your needs and adapted to your equipment, the problem becomes one of so defining the coal that it can be specified, and of determining the range of variation allowable in order that reasonable competition and assurance of supply may be had.

CHECK UP QUALITY PROMISES BY ANALYSIS

It is here that analysis plays a major but by no means the sole part. Analysis is a potent aid in defining what you want and expect to get, and acts as a basis for determining whether you actually get what is promised. Briefly, it means a partial definition of the coal by figures representing some of its constituents. Instead of a more or less descriptive trade name it substitutes numerical quantities which have something to do with its supposed value. As a movement well under way fifteen years ago, it had a steady growth in favor up to the time of the war. Its overenthusiastic friends were, as usual, its greatest enemies. Its shortcomings as a sole reliance for coal quality soon became apparent. As in most new things, the early tendency was to complexity, and specifications involving analysis became cumbersome and more or less a form. It soon became apparent that the method could be sadly abused to the detriment of either or both parties. The present tendency is to simplification and a shorter contract, and a better understanding of the part analysis may play in the purchase of coal.

AT THE SOUTHERN EXPERIMENT STATION of the U. S. Bureau of Mines, Birmingham-Tuscaloosa, Ala., determinations have been made as to the relative combustibility of different cokes in a brick combustibility furnace. Further work was done with the shatter and friability tests, and the true and apparent gravity determinations are practically complete. Float and sink tests have been made on a sample of coke breeze submitted by the Sloss Sheffield Company to determine if sufficient ash elimination could be obtained to make feasible the mixing of cleaned coal with raw coal before carbonization.

Better Ventilation as an Aid to Mining Efficiency

New Determinations of Coefficient of Friction—How Air Capacity of Mine Was Doubled and Water Gage Lowered—Equipment for Canvas-Pipe Ventilation—Good Air Stimulates Workers—Boosters That Fail to Boost

ABOUT \$4,000,000 has been expended in the better ventilating of the Butte mines so as to bring the air in them almost up to coal-mine standards. A paper by A. S. Richardson, ventilation engineer—note the title; they have experts in every department—of the Anaconda Copper Mining Co., was presented by W. P. Daly, the mining superintendent of that company, at a joint session of the American Institute of Mining and Metallurgical Engineers and the National Safety Council in the morning of Feb. 21. It is necessary here to pass over many interesting details related by Mr. Richardson in his paper regarding the difficulties of working in mines 3,200 ft. and even 3,400 ft. deep with temperatures reaching 104 deg. F. and with inflows of water at 113 deg. F., but a careful analysis of the causes of the high atmospheric temperatures are given—decay of mine timber, heat of mine water and rock, oxidation of sulphides, electrical current and mine fires. The author regards the decay of timber as being a more important source of heat than any other single cause, which is an interesting conclusion for coal men.

But though the paper contained much that has particular reference to deep and abnormally warm mines it is important to note that most careful measurements were made of the coefficient of friction, which expresses in pounds per square foot the pressures necessary to overcome the resistance offered by one square foot of rubbing surface at an air velocity of one foot per minute. In all cases the area used in making the calculations was the clear area of the air course inside the main timber, and the rubbing surface was assumed to be that which enclosed the clear area.

COEFFICIENTS OF FRICTION NEWLY ASCERTAINED

For rectangular shafts of two or more compartments with open timber framing the coefficient lies between 0.000000072 and 0.000000096, the variations being dependent mainly on the condition of the timber, such as lagging. For rectangular shafts in which each compartment is a separate smooth-faced duct, the coefficient runs from 0.000000014 up to 0.000000023. For timbered drifts and "crosscuts" (roadways across the vein) about 5 x 7 ft. in the clear the coefficient ranges from 0.000000077 up to 0.0000000109, the variations depending on whether the air course is straight or crooked. For untimbered crosscuts the coefficient lies between 0.000000031 and 0.000000044; the variations in this case are also dependent on whether the crosscut is straight or crooked. For the manway compartment of raises almost any figure from 0.0000000125 upward may be obtained, dependent on the condition of the raise—that is, the roughness of its interior surfaces.

These figures are based on gage readings that ranged from 3 in. to 15 in. and are believed to be fairly accurate considering the limitations of the instruments used and the character of the problem. It was possible to note the variations in resistance caused by the passage of a cage through the section of the shaft upon which the determinations were made, also by a man standing and walking in opposite directions in a drift and by a

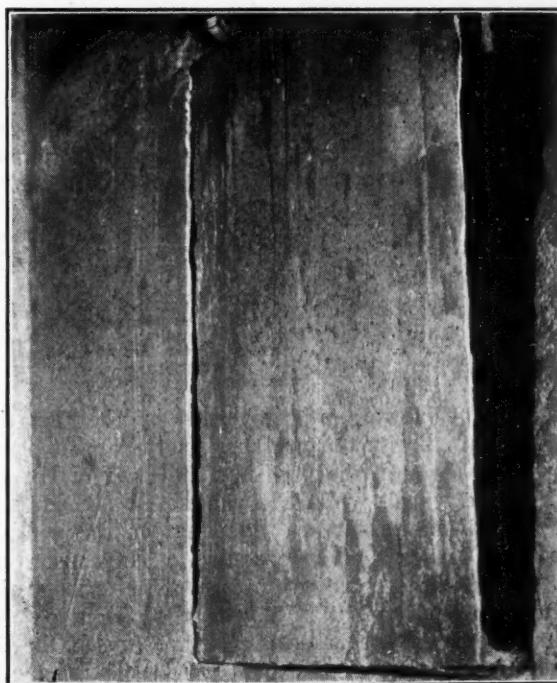
mine car standing in a crosscut, the last being equal to about 40 ft. of the crosscut.

Nevertheless, as all determinations made with either pitot tube or anemometer depend for their accuracy on the assumption that the flow of air takes place in straight lines normal to the plane in which the instrument is held, serious inaccuracies must occur because this assumption is unwarranted by fact. Obstructions such as mine timber, changes of direction of air courses and similar influences produce a swirling, or eddying, motion of the air which varies both in direction and velocity at all points across a given plane. Nothing beyond an approximation in measurements is, therefore, possible, and accuracy is in the greatest degree dependent on the care used in making it.

DOWN-AND-UP TRAVEL EXCEEDS CROSS TRAVEL

The coefficients that have been given are, therefore, nothing more than approximations, and must be so considered. Further, other conditions, such as local restrictions of clear area of workings and abrupt turns in main air courses, may have such a bearing on mine resistance that the use of calculations based on friction coefficients must be governed by careful judgment.

In his paper the author goes on to say that the speed of the air in the shaft is the important item and points out that in the Butte mines the air has to pass about 5,000 ft. down the shaft and up again, whereas it travels horizontally an average of little more than 1,000 ft. and is so split into slower moving currents in the under-



CONCRETE SHAFT-LINING SLABS AND ANGLE PIECES

These are pointed later with mortar, thus making the shaft fireproof. The illustration is taken from a photograph made before pointing the joints. Angle pieces are necessary to support the slabs as tops of wall and end plates are cut away by the falling rock.

ground workings that the friction is not great even when these airways are rough.

If it may be permissible to interject comment into this recital of the author's remarks it might be said that in coal mines the depth usually is far less rather than greater than the horizontal distance traversed by the air. In fact the ratio may be 200 to 1 in the coal mine as against 1 to 5 in these metal mines.

Perhaps this explains why at the Parnell shaft such wonderful results were obtained by smooth surfacing, though this shaft is not 5,000 ft. deep but only 2,800. Before the surfacing of the walls the fan at this shaft carried 135,000 cu.ft. per minute and after the walls were smoothed 260,000 cu.ft., the fan suction in inches of water gage being 3.6 in. in the first instance and only 3.4 in. in the other. This shaft draws air from two separate mines, so that the downcast speed is not nearly so great as that of the upcast. The Parnell shaft had one compartment 7 x 5 ft. and two others 5 x 5, so its clearance is 85 sq.ft. It will be noted from this that the speed of the air in the Parnell shaft is now 3,060 ft. per minute, which most coal-mining men would think excessive.

To return to Mr. Richardson: At first it was proposed to give the shaft a smooth surface by the use of 1-in. sheeting, surfaced on one side, but later, in accordance with the general fireproofing plans, the management decided to use concrete flat slabs and angular pieces, precast at the surface and held in position on the shaft timbers by wedges and cement mortar. The wooden wedges serve mainly to hold the slabs in position until the mortar has set. In shafts surfaced with sheeting nailed to the face of the shaft timbers, the nails are destroyed by copper water, so that the sheeting often falls across the shaft and obstructs the flow of air. As no metal is used in fastening the concrete slabs in position, this damage has been eliminated. In several shafts not only are concrete slabs used but concrete water boxes. These are set in the corners of the shafts.

FLEXIBLE PIPE USED IN DEAD-END PLACES

In confined places such as the dead ends of crosscuts, drifts and raises, small blowers are used to force fresh air from the nearest source of supply through canvas pipes to the working face. To standardize equipment the pipe sizes in Table I have been adopted.

TABLE I. SIZE OF VENTILATING PIPE.

Where Used	Length of Pipe	Size of Pipe	Size of Fan	Blade Size	Direct-Connected Motor
Raises where space available is small.	Under 250 ft.	8 in.	No. 2½	½ width, Sirocco	3 hp. a.c. standard wheel
Crosscuts and drifts.	Under 250 ft.	12 in.	No. 2½	½ width, Sirocco	5 hp. a.c. standard wheel
Other places, including stops	Over 500 ft.	16 in.	No. 4	½ width, Sirocco	10 hp. a.c. standard wheel

Selection of blowers was governed by the fact that within certain limits the pressure exerted by a blower to force air through the pipe is a function of the rim speed of the wheel, while the volume of air delivered against a given pressure is dependent on the width of the wheel. Under a given pressure, a canvas pipe will carry only a limited quantity of air. The problem then is to proportion the width of blower wheel so as to obtain maximum efficiency, considering the volume of air that the pipe will carry at the pressure developed by the blower when running at constant motor speed.

The power required to drive the blower, running at constant speed, decreases with each additional length of pipe added or with every increase in resistance to the flow of air, and increases to a maximum when there is

no pipe in place. Obviously, when the wheel is unnecessarily wide and the pipe does not carry all the air that the blower is designed to deliver at the pressure developed, the consumption of power is excessive. To provide against the possibility that the pipe accidentally be torn off the blower, and that the overload release may not act, an unnecessarily large motor must be provided in order to avoid burning up the motor, possibly causing a mine fire. The combinations of blowers and pipes mentioned are designed to give air velocities of 2,000 ft. per minute at the pipe ends under reasonably good pipe conditions. About three hundred blowers are normally in use.

Following Mr. Daly's presentation of Mr. Richardson's article D. Harrington presented a paper on the "Efficient Ventilation of Metal Mines." He remarked: "It is generally accepted that coal miners under the age of fifty are much more free from respiratory diseases than metal miners and it is practically certain that this immunity of the coal miner is due largely to the fact that working places in coal mines are much better ventilated than those of metal mines."

It is interesting to note that Mr. Harrington advised that places temporarily not working or permanently abandoned be sealed by canvas, gunite, concrete bulkhead or otherwise to prevent a loss of the air needed in active workings and to prevent vitiated air from abandoned places mixing with air that is to be used in active workings.

One of the most interesting papers of the session was one by J. J. Walsh, state mine inspector, Nanticoke, Pa., entitled "Coal-Mine Ventilation." Mr. Walsh showed that improvements in ventilation had greatly increased output and had done it without any direct effort on the part of the management. Table II will show the situation in brief.

TABLE II. EFFECT OF VENTILATION ON TONNAGE.

	Before Improving Ventilation	After Improving Ventilation
Mine 1		
Carbon dioxide, per cent.	0.50	0.32
Oxygen, per cent.	20.23	20.46
Dry-bulb temperature, deg. F.	68	69
Humidity, per cent.	86	60
Cars filled, per man.	1.443	1.661
Mine 2		
Carbon dioxide, per cent.	0.34	0.15
Oxygen, per cent.	20.42	20.60
Dry-bulb temperature, deg. F.	68	59
Humidity, per cent.	95	89
Cars filled, per man.	1.009	1.477
Mine 3		
Carbon dioxide, per cent.	0.37	0.22
Oxygen, per cent.	20.36	20.54
Dry-bulb temperature, deg. F.	69	68
Humidity, per cent.	85	67
Cars filled, per man.	1.169	1.475

The carbon-dioxide reduction and the oxygen increase would not justify the expenditures made to improve the ventilation of these mines. The reduction in humidity and the increase in the speed of travel of the air were the essential changes that resulted in the greater production per man. The carbon dioxide and the oxygen percentages are given solely to show that they were inconsiderable. The dry-bulb temperatures likewise were but little affected.

Mr. Walsh added that each fan should operate its own independent intake and return airway. Where two or more fans operate on the same intake and return, the increase in volume of air circulated does not warrant the expense of installing the additional fan. The volume of air that will flow through a mine depends on the difference in pressure between the intake and return airways. If an exhaust fan the dimensions of which are within practical limits is taking air from a mine with

a water gage of 2 in. and cannot furnish enough air, the installation of a second fan on the top of the upcast will not by any means double the quantity of air circulating.

Furthermore, if both fans were so arranged as to exhaust the air from the same shaft, each producing a 2-in. water gage, they would not create a greater difference in pressure between the intake and return than is created by one fan working alone. In fact if the rim speeds of the fans were not equal the volume of air might be reduced by the use of the second fan. We may go still further and say that it is possible, even in practice, for the rim speeds of the fans to be such that one will receive some of its air supply through the chimney of the other.

Booster fans usually are located underground between the intake and the return or at some point in either one of these airways. Their purpose is to help along a feeble air current. Where the movement of the air is broadcast and where much of the air produced by the surface fan is lost by leakage the conditions may demand their use, but a booster fan placed in a mine to assist a fan located on the surface will not increase the total volume of air passing through the mine to any appreciable extent, unless it is more powerful and generates a greater pressure than that generated by the surface fan; neither will it be of any local value unless it generates a pressure greater than that existing at the point of installation.

BOOSTER FANS BOOST ONLY CONSTRUCTION COSTS

Fans placed in tandem, one at the top of the upcast shaft (exhausting) and the other at the top of the downcast shaft (blowing), are of little value to each other. Assuming that an exhaust fan is producing a 2-in. pressure, if a force fan is placed at the top of the downcast shaft and run at a speed sufficient to generate an equal pressure it is capable of producing a velocity in the downcast shaft only slightly greater than that produced by the exhaust fan working alone. If the rim speed of the blowing fan is increased until the water gage reading is 3 in., while the exhaust fan remains the same, the velocity of the air will be increased. This increase is maintained entirely by the blowing fan, because the velocity in the air is greater than that which the exhaust fan with its 2-in. pressure is capable of producing.

The belief is quite general that two fans working in tandem or two fans exhausting at the top of the same upcast, each generating the same water gage, will deliver twice as much air as one of them working alone; this however, is not true. In order to double the quantity of air flowing through the same intake and return, the pressure must be increased four times and the horsepower eight times.

HOW VOLUME OF AIR CAN BE DOUBLED

The volume of air flowing through a mine can be doubled, however, by the application of twice the horsepower if the ventilating units are independent of each other; that is, by the installation of two fans, each having its own intake and return.

A communication was read from F. H. Kohlbraker, superintendent of the Susquehanna Collieries Co., sustaining the statements made in Mr. Walsh's paper. H. H. Stoek desired to know whether experiments into coefficients of friction were being made or could be satisfactorily made, on a laboratory scale. George S. Rice said that J. W. Paul, of the Bureau of Mines, was

investigating this subject at the Pittsburgh station. Mr. Paul stated that it had been found difficult to get reliable results because the air will not travel in straight lines and consequently the pitot tubes do not record correctly. In order to compel the air to flow straight, a honeycomb of tubes 15 ft. long had been introduced into the airway. The measurements will be made by a Whalen gage which will register one ten-thousandth of an inch of water gage.

Mr. Harrington said that small quantities of carbon dioxide and small deficiencies of oxygen might be unimportant in cool dry air but in humid hot air they might be far more deleterious. Mr. Walsh argued that the main points were the humidity and the heat and declared that at a temperature of 106 deg. without ventilation, life would become extinct. The temperature of the body would soon arrive at that of the atmosphere with fatal results. Mr. Walsh, discussing the relation between health and humidity, said that in a certain mine where influenza was epidemic, when the humidity was between 75 and 80 per cent, 61.6 per cent of the men had influenza; when it was between 80 and 85 per cent, 62.6 per cent were thus afflicted; when between 85 and 90 per cent, 52.4 per cent had that disease; when between 90 and 95 per cent, 39.2 per cent, and when between 95 and 100 per cent, 18.5 per cent.

In a subsequent meeting Mr. Daly explained that the main shafts had been gunited and the upcasts covered with concrete slabs. Asked why the main shafts have been treated with the cement gun he declared that this left the shape of the timbers exposed so that any rocks that might fall would bound from side to side, breaking their fall and saving the bonnet of the cage from injury. The bonnet would be readily pierced by a rock falling freely from the top of the shaft to the bottom. In fact it was customary to keep the gunited timber rings covered with dust so as to protect the gunite from falling material. The return was not gunited, as the object sought was to mask the timbers. However, it might be suggested that by the use of gunite properly backed the same result could be obtained and the shaft thus protected would be far more fireproof, for surely the fire can get behind the concrete shields that have been provided.



CONCRETE WATER BOXES

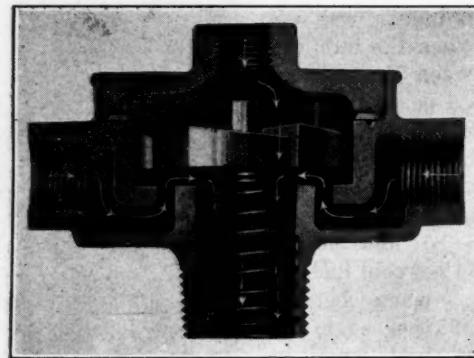
These are placed in the corners of the airshafts in the Butte mines. They offer a minimum resistance to the flow of air.

Cylinder Drain Valve That Is Always Open When Needed and Closed If Not Needed

ALL condensate should be carefully drained from the cylinders of reciprocating engines and similar equipment. If the cylinder cocks are not opened when starting an engine, the cold cylinder walls may condense enough water from the steam to cause trouble. This water is forced into the clearance space of the engine at a time when the exhaust is closed and the crank and connecting rod are approaching the toggling point. When this happens, provided enough water is present, it being mobile but incompressible, it either lifts the exhaust valve off its seat and escapes to the exhaust or some part of the engine must give way. As a rule the part to give is the cylinder head. Sometimes, however, if the water accumulates in the forward end of the cylinder, the piston is pulled off the piston rod or the rod is pulled in two.

One great objection to the ordinary cylinder cock or drain valve, particularly on stationary engines, is that they are forgotten and are left open after the engine has been brought up to speed and is thoroughly heated up. This allows much steam to blow to waste.

To overcome these difficulties and render it possible



CYLINDER DRAIN VALVE SEATS UNDER STEAM

When steam is off or not up to the standard pressure, the spring forces the valve off its seat and the condensate from the cylinder flows through the valve to waste. Thus the condensate cannot be shut within the cylinder when the engine is working.

for the engine driver to safely forget cylinder drainage the automatic relief valve shown in the accompanying illustration has been developed. This consists of five parts—a body, a cover, a gasket, a valve disk and a spring—only one of which is movable.

As may be seen in the illustration, the top of the device is connected to the steam chest or to the live steam at some point between the throttle and the engine valve. The two side openings are connected to the two ends of the cylinder and the bottom outlet leads to the drain. In the lower opening is placed a spring that bears against the movable disk above. This spring is screwed into a groove within this opening and consequently its tension may be adjusted without difficulty.

The top of the disk, of course, is subject to the pressure of live steam whenever the throttle valve is open. When the throttle is closed, however, the steam above this valve disk condenses, relieving the pressure. Accordingly the valve lifts, allowing this condensate to flow to waste. When the engine is being warmed up preparatory to starting, the pressure of the steam, which is, or should be, admitted slowly at first, is not great enough to force the disk onto its seat, so that the cylinder is effectively drained of the condensate. When

the steam is turned on fully, of course, the disk seats automatically.

Should a quantity of water accumulate at any time in the engine cylinder it will be forced to the drain valve, lifting the disk off its seat and relieving the pressure. The lifting disk is so constructed that at each opening and closure it revolves slightly. It is thus self-grinding and always tight.

This device is known as the improved Diel-More automatic drain and relief valve, and is being distributed by the Diel-More Sales Co., Bourse Bldg., Philadelphia, Pa.

Experts Debate Value of Storage-Battery Locomotives in Gathering Service

"**S**TORAGE-BATTERY Locomotives as Applied to Mine Haulage" was the sole paper applicable to coal mining read at the second of four mining sessions held during the meeting of the American Institute of Mining and Metallurgical Engineers. This paper, by Charles E. Stuart, appeared in *Coal Age* Feb. 16, 1922, on pages 277 to 284.

Howard N. Eavenson, in discussing Mr. Stuart's paper, said that when the coal measures are 5 ft. thick or over and the grades do not exceed 8 or 9 per cent, mules are preferable to storage-battery locomotives.

Under the most favorable conditions a two-mule team with a driver can gather as many as 75 to 100 cars in eight hours. During the last few years, however, such a team would gather on an average only 30 to 35 cars and in 1921, when efficiency fell to its lowest level, only about 30 cars would have been gathered. Mr. Eavenson said that he had never operated any type of gathering locomotive that would gather more than twice this number.

Mr. Patton, in response to a question as to the maximum grade a storage-battery locomotive could be operated on, said that he was in charge of the tests at the Lynch plant when the results were obtained which are tabulated in Mr. Stuart's paper. (This table is to be found on page 280 of the *Coal Age* reprint of that article.) In one of the rooms the locomotive pulled two mine cars weighing 9,600 lb. against a 17.5-per cent grade.

Mr. Eavenson then added that wherever a locomotive could gather two mine cars at a time it would give better results than a mule. Graham Bright said that he did not think it advisable to use storage-battery locomotives in those mines which had use for no more than three, for it would be too expensive to engage an expert to take care of them. When enough are used, however, to make it pay to engage such an expert they will be found preferable to trolley locomotives.

In referring to the combination locomotive equipped with two motors, one driven by power from a storage battery and the other by trolley current, he said that the system used would not be as satisfactory as to use two motors so connected that when being operated on trolley they would be in series and when on battery they would be in parallel.

COAL AGE INDEX

The indexes to *Coal Age* are furnished free to all who ask for them. The index for the last half of 1921 is now ready for distribution. A copy can be had by addressing a postcard to the subscription department of *Coal Age*.

American Institute of Mining Engineers Studies Systematic and Total Recovery of Mine Pillars

Extraction Figures Usually Too Large—Destruction of Roads and Railroads
—Accidents from Pillar Drawing—Correct Extraction Ratios from 67 Pocahontas Mines—Small Pillars with Speedy Extraction Tried Out Satisfactorily

A DECLARATION by H. H. Stoek that bituminous operators were deceiving themselves as to their percentage of extraction was the opening feature of the fourth meeting of the mining section of the American Institute of Mining and Metallurgical Engineers. He declared that one ton in two probably was wasted even now and that the declaration that "for every ton of bituminous coal mined in the United States a ton of pillar coal had been left in the mines" probably was quite true at the time it was made.

Mr. Stoek said that this loss of coal had been accompanied by a loss of life per thousand men employed that was higher than in any other of the leading coal-producing countries. He was aware that the United States had a lower loss of life per ton produced, but, he added, we merely beg the question and attempt to bolster up a bad condition when we adopt a peculiar unit for the statement of our accidents.

Quoting George S. Rice, he advocated the use of factors of recovery rather than of factors of loss because the statement of a loss arouses antagonism and, still quoting him, Mr. Stoek referred to the losses caused by "the natural, commercial and labor conditions, the requirement in many cases of boundary pillars under railroads and buildings which may be called for in the deed or lease, or, in the absence of a specific exemption in these documents, the common law requirement that a surface owner is entitled to the support of the surface."

REPORTS OF EXTRACTION VARY WIDELY

Mr. Stoek said that his inquiries in 1905 had shown percentages of extraction between 70 and 95 per cent, but doubtless they were too high. In 1914 A. W. Hesse gave the percentage of extraction as being between 55 and 97. The bulletins of the Illinois Coal Mining Investigations in 1915 gave the extraction for Illinois as between 41 and 96 per cent. An average of thirty panel mines gave 55 per cent and an average of forty-eight pillar mines 54 per cent.

In 1914-15 a committee reported that in a certain mining district about 65 per cent of the coal was being recovered. A subsequent survey of twelve of the largest mines in the district made by a number of engineers gave percentages of extraction varying from 37.7 to 49.5, or an average of 41.4 per cent. This large reduction in the estimate was due to the fact that in the first calculation the area excavated was alone considered and no allowance was made for 1½ ft. of top coal left in the shale roof. As the coal averaged 7.46 ft. in thickness the loss was 16 per cent from this alone.

In these mines it was hoped, when the survey was made, that much of the pillar coal would be subsequently recovered, but during a period of six years little of it has been mined and the indications are that little of it can be saved in the future. The pillars have been so weighted and crushed that they would furnish but

little coal and the hauling of such as there is would interfere with the transportation of the coal from the advance workings and so would reduce the daily output. This condition is one that is likely to obtain in mines which, like those here described, have a large production and have left pillars for future mining. Unless pillars are recovered quickly and pillar drawing forms part of the original planning, little pillar coal can be recovered.

Speaking of the obstacles which prevent the introduction of the Connellsville method into Illinois, Mr. Stoek pointed out four difficulties: (a) The coal is not intended for coking and therefore must not be



HORACE F. LUNT
Commissioner of Mines, Bureau of Mines, Denver.
Col., who with B. F. Tillson presided at the joint session of the National Safety Council and the American Institute of Mining and Metallurgical Engineers.

crushed; (b) the labor is unionized; (c) the men may not be shifted from place to place and work therefore cannot be concentrated at the points desired, for each man demands his own room and not to be shifted once he is in it; (d) yardage has to be paid for as narrow work.

Mr. Stoek said that the railroads were seriously considering the value of the coal under their rights of way where these are underlaid by coal and is still held by them or leased to coal companies. In a circular in the report of the subcommittee of the President's Conference Committee upon the "Federal Valuation of Railroads in the United States" dated Nov. 1, 1921, an estimate is given of the percentage of coal that must be left at various depths to support the surface. This appears in this article as Table I, on the next page.

TABLE I. PERCENTAGE OF COAL NEEDED TO PROTECT RAILROADS FROM SUBSIDENCE

Depth Below Surface, Feet	Percentage Recovery
0 to 50.....	100
50 to 100.....	70
100 to 200.....	60
200 and deeper.....	50

This table, says Mr. Stoek, is open to serious objections, as it takes no account of the character of the overlying material, and the results in Illinois, at least, show that 50 per cent of the coal left at a depth of 300 ft. and more may not prevent subsidence. In the near future the question as to what will constitute a proper support for public highways also may arise in view of the large sums being spent for hard roads throughout the United States.

Mr. Stoek added: "Although statistics are not available regarding the relative numbers of accidents in pillar drawing and room work, many inspectors connected with liability-insurance companies and operating officials have expressed the opinion that there are no more accidents in pillar work than in ordinary room-and-pillar workings and that while such work requires careful workmen, often they are not unusually skilled."

An interesting note in Mr. Stoek's paper is to the effect that the mine law in West Virginia relating to the spacing of crosscuts has been interpreted to mean that openings shall be 80 ft. apart, but that it is not necessary that this distance be found on any one side of the working place. Crosscuts have to be provided every 80 ft. on one side or the other of the room. Thus crosscuts which in other states would be said to be 160 ft. apart are regarded as 80 ft. apart in West Virginia. This makes it easy to leave a more adequate pillar.

ACTUAL FIGURES ON POCOHONTAS RECOVERIES

Mr. Clagett then presented his paper on "Systems of Mining in the Pocahontas Field and Recoveries from Them." As *Coal Age* expects to publish this paper soon it will be only briefly described. The author shows the way in which the Pocahontas operators drifted from one method to another in pursuit of the system of mining that would afford the largest percentage recovery at minimum mining cost and wound up by showing how percentage of recovery per acre-foot increased with decrease of coal thickness and that the mines opened between 1883 and 1890 had to date a recovery per acre-foot from the area mined out of under 80 per cent, but that the mines opened between 1911 and 1920 had recovered per acre-foot over 90 per cent of the coal in the ground. The figures given cover 94 per cent of the total production of the Pocahontas field.

E. J. Newbaker, of the Berwind-White Coal Mining Co., gave an account of the extraction at Winber, and Mr. Browning gave some figures regarding the recovery at the mines of the Solvay Collieries Co. These recoveries run 95.5, 89.7 and 92.4 per cent. Frank Haas declared that he believed that care should be taken not to put excessive emphasis on 100-per cent extraction. Much of the coal must be left—some for boundary pillars, some for the protection of gas and oil wells, and also some for common roads and railroads. Furthermore, where only 5c. profit can be made from the coal on extraction it does not pay to spend an extra 50c. for timber merely to be able to boast about a 100-per cent recovery.

G. S. Rice pointed out that, contrary to Prof. Stoek's statement, it was often found that the coal in pillars could not be maintained as clean as coal from rooms.

Weight on the pillar columnized the pillars and the column fractures extended through the binders as well as through the coal, breaking up the impurities into small pieces which it was almost impossible to eliminate in the mine or on the picking table. He believes that rooms should not be driven till it is convenient also to draw the pillars. When pillars are left standing, not only the rooms but also the headings are filled with falling rock. The Bruceton experimental mine, near Pittsburgh, has been exposed to severe explosions and yet has stood with little or no caving for about ten years. Mr. Rice declared that in his belief this is due to the fact that practically no rooms have been driven and in consequence the roof in the roadways has been but little exposed to strain. Heavy falls had occurred, however, in the roadways of all the mines adjacent to that at Bruceton.

ARE PILLAR WORKINGS UNDULY DANGEROUS?

R. N. Hosler, of the Coal-Mine Section of the Pennsylvania Compensation Rating and Inspection Bureau and president of the Coal Mining Institute of America, declared that investigations made in the bituminous regions showed that more accidents per man employed occurred in pillar drawing than in room driving. Referring to Table XXII of the "Statistical Analysis of Coal-Mine Accidents, 1916 to 1920 Inclusive," he declared that the fatalities from falls of roof and coal were 1,231; of these 163 occurred in the entry beyond the last crosscut, 644 in working places, also in advance of the last crosscut, and 424 in pillar drawing. As only 20 per cent of the men mining coal were working on pillars it seemed that their fatality rate was unduly high, as it composed between 34 and 35 per cent of all fatalities from falls of roof or coal.

Time being limited the discussion was postponed, and D. C. Ashmead's paper "Can Anthracite Mines Be Operated Profitably on More than One Shift?" was presented. R. V. Norris said that valuable byproducts of the paper were the charts showing the number of men employed in mines of various sizes. This would prove quite useful in determining whether the practice at any mine was below or above the average standard, a criterion which had heretofore been lacking.

W. B. Daly presented E. M. Norris's paper on "Underground Fire Prevention by the Anaconda Copper Mining Co." and H. J. Rahilly's address on "Mine Fires and Hydraulic Filling." In commenting on the first paper he said that the mines were patroled after the men had left them as a protection against incendiaryism and carelessness, that there were eighty helmets maintained and 500 men had been trained to use them. Fourteen or fifteen fires had occurred since this force of men had been trained and equipped, but they all had been extinguished in a few hours owing to the completeness of the provision for meeting them. At the North Butte fire some years back 162 lives had been lost by a short-circuit in a timber shaft. The company hopes to avoid this hazard by the guniting of the main shaft and the covering of the airshaft with concrete slabs. This work has already been done. There were water lines in every level and at some of the working faces.

As for hydraulic filling, Mr. Daly said that it had been proved that water when applied clear made channels through the open area and so did not put out the fire. By silting the whole area was completely filled with material, thus shutting out air. Horizontal timbers

were not only coated above and at the side but the silt came up from below and made a really tight job.

Frank Haas commented on the speed with which air was forced to travel up the Parnell airshaft. He regarded 1,300 ft. per minute as a limiting speed. Mr. Daly said that while 2,500 to 3,000 ft. per minute was the speed in airshafts, a velocity of from 300 to 400 ft. per minute was used in the mine roadways.

After lunch the meeting was again called to order and discussion continued relative to pillar recovery. Mr. Eavenson questioned Mr. Stoek's statement that large pillars were needed for large percentages of extraction, saying that small pillars with rapid extraction were being tried in the Connellsville region. The experience has been successful where the cover is about 250 ft. thick. A trial of the system will be made under 450 ft. of cover. Narrow rooms 10 or 11 ft. wide are driven for a distance of 250 ft. with 32-ft. centers. Then two 6-ft. slabs are taken off one side and one 6-ft. slab on the other. This is done quite rapidly with a machine, and the coal is loaded out before the roof has an opportunity to fall.

A PILLAR ROOF LESS UNCERTAIN THAN ROOM ROOF

Mr. Stoek expressed his surprise at Mr. Hosler's figures, which were contrary to what he had been led to believe. Mr. Eavenson was quite of the same opinion, saying that when undermined in room working the kettle bottoms in the mine roof tended to stay up for a while, descending later, without warning on any unfortunate who might happen to be beneath them. They were not so treacherous when over a pillar, where they gradually got more or less loose in course of time. When the pillar was shot they came down with the coal and were harmless.

R. D. Hall said the same probably was true also of heavy draw slate, which, being free of the main roof, would fall with the coal, and therefore was no longer menacing. In fact everyone seemed in accord with Mr. Stoek, though Mr. Hosler seemed to have the advantage with his figures. It may be noted that Mr. Hosler's statistics had to do solely with Pennsylvania bituminous coal. Hence the suggestion that they were unduly affected by the fatalities in heavily pitching thick anthracite was not justified. For those who are interested it may be said that in the anthracite region the working-place fatalities from falls of roof and coal were 864 as against 285 in pillar work, a ratio of a trifle over 3, whereas the falls-in-room-work fatalities in the bituminous mines of Pennsylvania were 644 as against 424 in pillar work, a ratio of about 1.5, about half that for anthracite mines. As much second mining is being done in the anthracite region it would seem that pillar work is safer than room work in anthracite mines, and room work safer than pillar work in the bituminous region of Pennsylvania.

Mr. Eavenson briefed Erskine Ramsay's report on Alabama extraction and Mr. Hall the paper on "Mine-Timber Preservation," by R. R. Hornor and G. M. Hunt, the former being mining engineer of the Bureau of Mines and the latter in charge of the section of wood preservation, U. S. Forest Products Laboratory, Madison, Wis. The authors said that "Coal mines in the anthracite region of Pennsylvania, where twenty to twenty-five years ago the best grades of white and red oak, chestnut and pitch-pine timber could be obtained locally, now have to depend for mine timber upon an inferior quality of Southern loblolly and second-growth

yellow pine. Although the first cost of this inferior timber is relatively small, yet when the cost of freight coupled with the comparatively short life of such timber is taken into account, its use is expensive. It is essential, therefore, that the natural life of these varieties of timber be prolonged by some method of preservative treatment.

"Decaying and punky timber, especially where the bark has not been removed, is a considerably greater fire menace than sound peeled timber. Therefore any steps taken to prevent mine timber from decaying will lessen the fire hazard. It is a well-established fact that peeled timber is more durable than unpeeled timber, and it is stated by one authority that the life of timber placed in dry workings may be increased 10 to 15 per cent by peeling. Bark acts as an impervious coating and retards the loss of moisture from timber, thus making the conditions more favorable to fungus attack. It also offers an excellent breeding place for many wood-destroying insects, which not only weaken the timber but cause it to decay more rapidly. Other considerations favoring peeled timber are that it usually is less inflammable than unpeeled timber, and where it must be shipped for any considerable distance by rail the peeling at point of shipment will effect a saving in both freight and cost of handling by reducing the weight from 6 to 10 per cent of the original green weight. Furthermore, timber which is to be given a preservative treatment must be thoroughly peeled before it can be successfully treated. Even a slight amount of the inner bark adhering to the timber often will cause imperfect treatment results.

"Seasoning mine timber, like peeling, has a number of advantages which may be stated as follows: (1) Increases the strength and in some cases the durability; (2) decreases the weight and thereby reduces the cost of freight and handling; (3) protects from insect attack and decay before the timber is placed in service, and (4) makes the timber more easily susceptible to preservative treatment.

SEASONED TIMBER MUCH STRONGER THAN GREEN

"Actual tests have shown that thoroughly air-seasoned timber has 25 to 50 per cent greater strength than green timber. This increased strength is a decided advantage for mine timbers, as the maximum strength is required when the timber is taking the initial weight of the ground. It is claimed by some that the life of seasoned mine timbers when placed in dry and well-ventilated places will be considerably longer than the life of green timber, while others hold that green timber for mine purposes is as durable as seasoned timber. From numerous observations made by one of the writers in a number of metal mines of the West, he is of the opinion that under most conditions the thoroughly seasoned and peeled timber is more durable than green timber for the reason that it reabsorbs moisture slowly and therefore is more resistant to fungus attack than green timber.

"Perhaps one of the greatest advantages to be derived from the seasoning of mine timber is the saving in the cost of freight and handling. To effect this saving the timber must, of course, be seasoned at the point of origin. It has been shown by experiments conducted by the Forest Products Laboratory that air-seasoned mine ties and props up to 11 in. in diameter lost in three months' time from 15 to 35 per cent of their original green weight, depending on size and variety of the

timber. Air seasoning is not usually complete in large timbers in less than 1 or 2 years, but in general much of the advantage of seasoning is realized in 3 to 6 months, depending upon locality and the kind of timber.

"Timber storage usually is not given the attention it deserves. Proper storage is essential for proper seasoning, also for preventing undue checking and incipient decay before the timber is placed in service. Timber yards should be well drained and free from vegetation and decaying wood. The timber should be placed on skids raised a foot or more from the ground, and should be so piled as to insure free circulation of air.

"The following economies resulting from the use of treated timber are enumerated: (1) Reduces cost of maintenance and thus effects a saving in labor and timber; (2) inferior grades of timber may be utilized, which usually are cheaper and more accessible than the more durable grades; (3) reduces loss from delays and interrupted production often caused by timber repairs and renewals; (4) saves cost of supervision and overhead expenses due to repairs and renewals, and (5) lessens timber consumption per ton mined and consequently lessens the cost of production per ton.

In regard to zinc chloride Hornor and Hunt declare: "It is a metallic salt, soluble in water in all proportions. Solutions of about 3 per cent to 5 per cent strength are used in making timber treatments, but in order to reduce freight charges it is usually shipped in the solid form in air-tight iron drums, or in 50 per cent solution in tank cars or drums. The importance of this salt as a wood preservative and its general wide use in this country are indicated by the fact that practically 50,000,000 lb. were used for preserving wood in 1920.

"The quality of zinc chloride used in treating wood is indicated by the following specification which has been adopted as the standard of the American Wood Preservers' Association: 'The zinc chloride shall be acid free and shall not contain more than 0.1 per cent iron. Fused or solid zinc chloride shall contain at least 94 per cent chloride of zinc. Concentrated zinc chloride solution shall contain at least 50 per cent chloride of zinc.'

ZINC CHLORIDE STABLE IN RAILROAD TIES

"On account of its solubility in water zinc chloride is not as suitable as creosote for use in very wet places. Its principal use has been in the preservative treatment of railroad ties, and its proved effectiveness for this purpose shows that it does not wash out of the wood very quickly even when exposed to the weather.

"The chief advantage of zinc chloride is its cheapness. One-half a pound of zinc chloride per cubic foot of wood is the amount ordinarily injected. At present prices this amount costs only about 3c., whereas creosote is much more expensive. Other advantages are its cleanliness, its lack of odor and color, convenient shipment and storage and absolute freedom from fire hazard. Zinc chloride cannot be considered as a fire retardant and there is no evidence that it decreases the inflammability of wood. On the other hand, it certainly does not increase the inflammability of the wood, and like creosote, it keeps the fire hazard at a minimum."

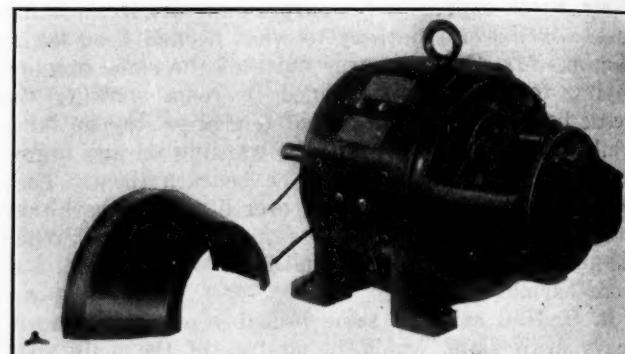
Several speakers, including R. V. Norris, referred to the increased life of timber that always results from its immersion in sulphate mine waters, either iron or copper sulphate, and said, as did the authors of the paper, that this method of preservation, especially in copper sulphate, was being used at some mines with excellent results.

Direct-Current Motors for Pump Driving

CHANGES are being made in direct-current electric motors to adapt them to the work of driving mine pumps where roof water and unfavorably moist conditions are encountered. The design and construction of these machines are the results of an extensive investigation into the conditions under which such pumps operate.

Motors of six different sizes and ratings, in all of which the design and build are standard, have been constructed by the General Electric Co.. They are all compound-wound with approximately 15 per cent series winding. They have four main-field and two commutating-field poles, all of which are laminated and bolted to the frame, which is of cast steel, octagonal in shape, and provided with a large hole in the bottom to afford drainage. The leads are brought out through heavy insulating bushings to a connection plate on the side of the frame. Stamped markings on both the bushings and the connection plate above each lead show the external connection for both directions of rotation.

Not intended to run totally inclosed, yet as a protection against dripping water, these motors are provided on the



PUMP MOTOR REDESIGNED TO SUIT WET CONDITIONS

Motor is provided on the commutator end with a half-cover of sheet metal, the top of the shield on the pinion end being solid.

commutator end with a half-cover of sheet metal, the top of the shield on the pinion end being solid. Another detail in this motor is the large housings on the end shields for the motor bearings. These have provision for waste packing. The end shields carry the brush-holder studs and bearing housings. These latter are interchangeable on all types except one, the 230-volt machine, which requires larger brushes.

On all sizes except the 550-volt motors, the end shield carries the brush-holder studs. The large commutator on the 550-volt motor requires a special bracket, which likewise is secured to the end shield. Thus, by moving the entire shield, the brushes are shifted, the bolt holes being drilled large enough to allow the necessary rotation. When the proper position of the brushes has been determined the shield is doweled to the frame and the bolts tightened. The brush holders are specially designed and so constructed as to prevent chattering or the rocking of the brushes within the holders.

Armature construction is the same for all sizes except in the three smaller machines. Here the punchings are assembled directly on the shaft instead of on a sleeve, as is the practice in the larger sizes. All these machines have open slots and coils of the pre-heated form-wound type. This type of coil makes it easy to repair the armature when needed. Both the field and armature coils are impregnated with moisture-proof compound as a protection against dripping water and dampness.



Problems of Operating Men

Edited by
James T. Beard



Timbering High Cave on Roadway

Fire Causes Heavy Fall of Roof on Haulage Road—Special Form of Timbering Required to Reach Sandstone Thirty Feet Above Rail—Boom Used to Protect Workmen Removing Fall

NOTICING the interesting article of Alphonse F. Brosky, *Coal Age*, Dec. 8, p. 923, describing methods of supporting roof that has caved to a considerable height on a roadway, it occurred to me that a brief account of our own experience in that line would be of interest.

The inclosed sketch will serve to make clear the condition with which we had to contend and the method of timbering adopted to secure the roof, in removing the fall and making the road safe for haulage.

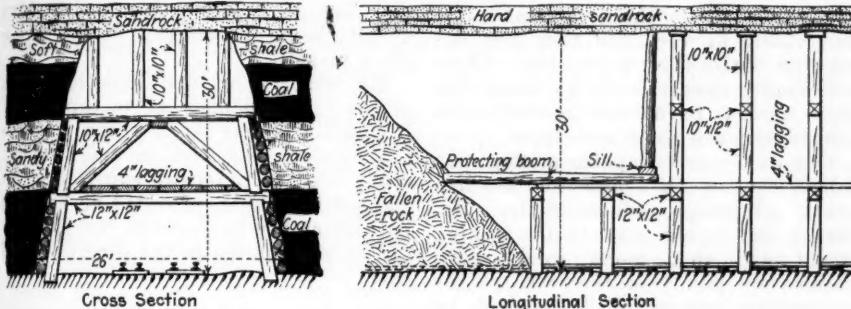
This style of timbering was found very satisfactory. The fall occurred on a main haulage road and was the

to wear breathing apparatus; otherwise they could not have lived in the atmosphere of the place.

HEAT AND SMOKE MAKE THE WORK DIFFICULT

Owing to the heat and the smoke above the fall, it was possible to set in place only the lower deck of timber frames near to the fall. The second deck of timbers was placed above these; but that work had to be kept at a distance back from the edge of the fall.

Naturally, the heated air and smoke hung high in the roof, which made it impossible for the men to see to per-



SHOWING METHOD EMPLOYED TO SECURE ROOF OVER HIGH FALL

result of a fire that caused the roof to cave to a height of 30 ft. above the rails. The width of the opening was also increased to 26 feet.

As shown in the figure, there were two seams of coal separated by a few feet of sandy shale, which is soft and comes down easily. Although the upper seam forms an excellent roof in working, as the result of the fire that fell also, together with the soft shale above the upper seam.

EFFECT OF FIRE ON HARD SANDROCK MADE IT UNSAFE

Fortunately, the rock overlying that seam was a hard sandstone, which ordinarily stands well. However, as it had been subjected to a strong heat it seemed best to support it with timbers and, for that purpose, the form of framing shown in the figure was adopted.

The material that caved was very hot and the air in the entry was bad. For that reason, the men working to remove the fallen mass were obliged

form the work of setting the upper timbers at a closer range in the heading.

As quickly as the first deck of timbers was extended, lagging was placed behind the legs, on each side of the road, to give support to the ribs. Also 4-in. planking was laid over the collars to protect the men from any loose pieces of rock that might fall from the roof.

As a further protection for the men who must work beyond the last set of timbers, it was found necessary to use long timbers or booms laid above and resting on the lower deck of timbers. As shown on the right of the figure, the ends of these booms were held down by long posts set on a sill running across the ends of the booms. These posts extended to the roof. This saved at least two accidents that might have proved fatal.

As the upper deck of timbers was put in place, each timber-frame was tightly wedged and the lagging supporting the ribs was carried up on each side, after the manner shown in the figure.

Above this second deck short posts were set against the sandstone roof. The work of timbering this piece of roadway has since proved eminently successful.

A. C. WATTS.

Chief Engr., Utah Fuel Co.
Salt Lake City, Utah.

Removing Gas by Boreholes

Specific gravity of methane being less than air that gas filling the borehole produces an air column equivalent to a water gage greater than that due to the ventilating pressure.

IN the issue of *Coal Age*, Feb. 16, p. 292, "Student" of Brownsville, Pa., asks for information on the removal of gas by boreholes. Judging from his remarks he has seemingly overlooked a very important factor in this problem.

It should be remembered that explosive gas is generally lighter than air; and, in the case of pure methane, the gas is only one-half the weight of air, at the same temperature and pressure. With a borehole, say 300 ft. deep, the difference in specific gravity between methane and air would be equivalent to a trifle less than a 2-in. water gage, which is above what is ordinarily encountered in mine work, at such a point in the ventilating system.

As a practical proposition it has been my experience that a borehole will deliver dangerous gases, irrespective of whether the fan is blowing or exhausting. It might be of interest to this inquirer to refer to *Coal Age*, Vol. 5.

FRANK HAAS,
Consulting Engineer.

Fairmont, W. Va.

Attention to Timbering

To reduce accidents start at the timbering of the working face—Employ systematic methods—Judgment of miners not reliable—Cut timbers on surface—Stop a miner's turn who does not timber his place properly.

WITH much interest I read the letter of George Edwards, *Coal Age*, Dec. 15, p. 968, entitled "Safe Rule in Timbering." The line of thought therein expressed should appeal to all men who have the welfare of their miners at heart.

The fact is well known that most of the accidents, in our mines, are caused by falls of coal and rock at the working face. Here, then, is the place to start, if we are to accomplish anything in reducing the number of these accidents.

So large a number of miners are injured every year in this manner that

any appreciable reduction in the number of accidents at the face will be money saved. To my mind, there is no better method of handling this phase of coal mining than to adopt a systematic method of timbering the coal face in a mine.

What then is meant by "systematic timbering" at the face? There are numbers of mining men who will not listen to any argument in favor of adopting a uniform set of rules governing the timbering of working places. They reason that every miner should be able to keep his place safe, provided the mine foreman and his assistant inspect these places regularly while the men are at work.

TAKING THE GAMBLER'S CHANCE

With Mr. Edwards, I feel that the class of miners that are willing to take a "gambler's chance," in the timbering of their places, are growing fewer every year. The men in charge of our mines, today, are far less prejudiced than formerly and the result is that more systematic rules are being established every day.

It has always been my practice to establish rules, for timbering working places, that would make the worst places in the mine safe. I am then sure that there will be no trouble in other places where the conditions are more favorable. My experience is that the majority of miners are not to be relied on to use their own judgment in respect to the timbering of their places. On that account, I deem it safe to employ a systematic method of timbering all places. On entering a miner's place, I expect to find it properly timbered according to the rules laid down for the mine.

Mention has been made, by some writers, of miners cutting their own timber, to length, in the mine. In my opinion, this is a job that should be done on the surface. I do not favor the plan of having the timber cut to exact measure in the wood, particularly if this is at a distance from the mine.

ASSISTANTS MEASURE FOR TIMBER

My plan has been to have one of my assistants go around in the mine and measure the length of timbers required in the miners' places. The timbers are then cut to that measure in the supply yard, sent into the mine and delivered to the places where they are needed. When this is done, no miner will have any excuse for not timbering his place.

Each assistant knows that he is held responsible for the timbering of all places in his district. Should I find that a man has not timbered his place in the manner prescribed by the regulations of the mine, I would stop his turn and no more coal would be hauled from that place, or empties sent in, until the necessary timbers are properly set.

As foreman, I have found a good plan is to vary my visits, so that they will fall when a miner is least expecting me around. This seems to be a neces-

sary practice of foremen, in order to discourage the taking of chances by the miners, and fewer men are killed. What is needed is the strict enforcement of a few good rules in reference to timbering.

OSTEL BULLOCK,
Foreman, Liberty Coal Co.
Hillside, Ky.

Many Fail Where a Few Succeed

Ability to lead the key to success—A misfit in an organization can never succeed—The likable man—Keen insight and tact in handling men, chief factors—Power to organize and systematize needful.

WITH feeling interest I read the unfortunate experience of a writer who signs himself "Western Inquirer." He describes the difficulty he has had in getting any one to recognize and appreciate his training and ability.

The lot of this man is not an uncommon one, in coal mining and many other industries, though it is often hard to explain. There is something mysterious about the individual ability to boss. It is a natural gift, depending largely on the disposition of a man, rather than on the training he has received.

MEN WHO FAIL TO HARMONIZE ARE MISFITS IN AN ORGANIZATION

We observe men who have a world of knowledge at their command and are willing to work, but they lack the peculiar quality of leadership. Their personality appears to be so tuned that they cannot harmonize readily with others who are their associates.

One of the most capable mining men I have ever met is a man who has had every advantage, educationally. His father was a big man in the mining world and that alone would have secured for him, from the start, all the recognition one could desire had he possessed a different disposition, which was his one drawback.

This young man was a misfit in the organization to which he belonged. There was no question as to his being a star, so to speak, by reason of his father's position. But unconsciously perhaps, he bore toward everyone a natural feeling of superiority.

At every turn, he showed a lack of sympathy for others' views and opinions. Though wholly natural, this attitude toward his fellows made him out of tune with all his associates. He was, in every sense of the word, a misfit in the organization and his manner was a bar to his own success.

THE LIKABLE MAN SUCCEEDS

Looking back a few years, I recall another young man in whom I was accustomed to take much interest. As I could plainly see that he would have a hard time getting along, because of certain handicaps, I took him under my wing, so to speak, and gave him every assistance possible.

Socially, the young fellow was as a rat in a strange garret, when among his friends and associates. He could

neither dance nor sing, having no knowledge of music. At a social function, he was a wallflower, seldom entering into the activities and enjoyment of the occasion.

Notwithstanding these drawbacks, and hindrances in his disposition, he was a most likable fellow. Everyone liked him and was willing and anxious to help him. He never antagonized anyone or anything. In charge of men, he never spoke a stronger word than, "Put the boots to the fellow if he begins to lag."

My friend didn't go up the ladder of fame quickly, as may easily be supposed. For a long time, he hovered on the bottom rung. Then, one bright day he took an upward start and, from that time, ascended like a skyrocket.

To day, I am proud to say, at the age of 38 he is vice-president and general manager of one of the leading coal corporations of the country. I cite this instance, hoping to encourage some to look forward and upward.

Pikeville, Ky. GEORGE EDWARDS.

ANOTHER LETTER

AFTER reading the brief but appealing letter of "Western Inquirer," *Coal Age*, Dec. 29, p. 1055, in which he deplores his inability to secure the position for which he feels he has fitted himself by training, experience and study, I sympathize with him deeply, being practically in the same class myself.

My observation and experience, in recent years, inclines me to think that it does not matter much whether a man has a college education, or must depend solely on his practical experience, to succeed in mining, provided he has the natural ability to perform the particular duties required in the production of coal.

CHARACTERISTICS THAT DEVELOP THE SUCCESSFUL FOREMAN

My conviction is that a successful mine foreman must have a natural disposition that will enable him to observe things quickly and be tactful in the handling of men. These qualities are more essential to the present-day foreman than the possession of technical knowledge of mining.

Nowadays, coal companies employ expert aid, in most instances, in estimating on the larger propositions connected with the industry. The same is true, also, in respect to many smaller details that the mine foreman of yesterday was compelled to handle himself.

What is now required of the average foreman is the power to organize and systematize the work in his charge. He must maintain an uninterrupted flow of coal, from the working face in the mine, to the tipple where it is dumped into the railroad cars for shipment.

Because a foreman is given to telling the "funny stories" mentioned by our friend, does not make him any the less efficient in the mine. It will often prove a helpful trait in his character and as-

sist him in securing better work from the men in his charge.

In the coal industry, men have varying ideas regarding the operation of their mines. While some operators prefer a class of trained and technical officials to place in charge, others regard the practical experience and judgment of men as their chief asset.

FOREMEN WHO ABUSE THEIR MEN

We find men filling official positions, whose chief characteristics is their ability to use vile and abusive language in dealing with their men. This class of official is at times preferred by some companies, in the belief that such a one can get more work out of his men than a man of a more gentle disposition.

It is these varying characteristics, both in companies and the men they employ, that are a discouraging factor in the lives of many men who have fitted themselves for positions they are unable to secure, after long and protracted effort.

EXPERIENCE.

Staunton, Ill.

Fire Prevented by Use of Salt

Entries sealed to extinguish fire—Reopened and salt, used in blasting, has good effect—Omitting to use salt causes another fire—Black powder replaced by permissible powder.

CONCERNING the question of using salt in the stemming when blasting coal in a dry and dusty mine, which has been discussed in *Coal Age*, recently, permit me to give some of our experience in that regard. We were using black powder, at that time, in the mine and had been troubled with fires due to blasting.

One of these fires, in 1919, had made it necessary to seal off two pairs of entries. These were the ninth and tenth north and the main east entry and air-course, in Mine B, at this place. These entries remained sealed for thirty-one days.

Upon then opening the seals, the entries were cleaned up and we started blasting the coal on the solid, as before. We continued to use black powder, but adopted the plan of placing a 10-in. dummy of salt next to the powder. I should state, here, that the entries were still generating gas, which made it more necessary to take precautions against the occurrence of fire.

FAILURE TO USE THE SALT

For a period of 10 months, we experienced no trouble. Then one day, the entrymen shot five holes at one time in the ninth and tenth north, off the east entry. Of these shots one was in the ninth north, two in the tenth north and one in No. 5 roomneck, on the ninth and another in the corresponding room on the tenth north. These shots were fired without any salt being used.

That night the firerunner found three fires, one on the ninth north entry and one in each of the rooms mentioned. Again, we were obliged to seal off these two entries, placing the seals in the same positions as before.

These seals remained in place for six weeks, and it took six months longer to clean up this section of the mine and make it fit for work. Following this experience, black powder was used for a period of four months; but all shots were fired with salt in the stemming.

Although no fires resulted during that time, it was thought best to use permissible powder, instead of continuing the use of black powder, since

we were now installing machines for cutting the coal and producing more dust than before. Up to the present time, no further trouble has been experienced in blasting. State Mine Inspector Morgan, who examined this section of the mine, expressed himself as well pleased with the good results obtained by the use of salt. I want to urge its use.

PETE BOLAND,
Herin, Ill. Mine Manager, Mine B.

Inquiries Of General Interest

Is the Mixture Explosive?

The Depletion of Oxygen, in a Mixture of Air and Inflammable Gas, May Be Sufficient to Extinguish a Light and Yet Be Highly Explosive as an Accumulation in a Mine

IN looking over the mine fireboss of carbon monoxide requires but half questions for the State of Indiana, a volume of oxygen in burning. As published in *Coal Age*, Feb. 9, p. 252, permit me to ask if the answer given to the last question on that page is correct. The question reads as follows:

A chemical analysis of mine air showed the following: Nitrogen, 80 parts; oxygen, 12 parts; marsh gas, 3 parts; stinkdamp, 1 part; blackdamp, 3 parts; whitendamp, 1 part. Is this an explosive mixture? Give reasons for your answer.

The reply to this question states that the mixture is "highly explosive," because it contains 5 per cent of explosive gases; viz., methane (marsh gas), 3 per cent; hydrogen sulphide, (stinkdamp), 1 per cent and carbon monoxide (whitedamp), 1 per cent.

It is my belief that this is an explosive mixture and, if so, I fail to see how it would burn or explode. The mixture is short of oxygen, the latter being depleted to 12 per cent, and we are taught that an oil flame is extinguished in an atmosphere containing 16 per cent of oxygen. In my opinion, if this mixture had contained 17 parts of oxygen, the 3 parts of blackdamp present would still render it non-explosive.

THOMAS HUGO.

Princeton, Ind.

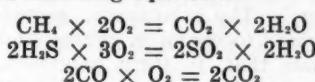
While it is true that the analysis of the mixture shows the oxygen of the air to have been depleted below what is necessary to support a lamp flame burning oil, such fact does not prove that there is not still oxygen sufficient to burn the methane, hydrogen sulphide and carbon monoxide present, which would cause the mixture to explode if ignited by a flame of sufficient volume and intensity.

It is well known that the complete combustion of one volume of methane requires two volumes of oxygen. Likewise, one volume of hydrogen sulphide requires one and one-half volumes of oxygen to consume it, while one volume

of carbon monoxide requires but half a volume of oxygen in burning.

On this basis, the three parts or volumes of methane will require six volumes of oxygen; and the one volume each of carbon monoxide and hydrogen sulphide will consume two more volumes of oxygen, making but eight volumes in all, while the analysis shows 12 parts or volumes of oxygen present.

The chemical reaction that takes place in each of these cases is shown by the following equations:



All that is required to start these reactions is the necessary amount of heat or a flame of sufficient volume and intensity. A lamp flame has neither the volume or intensity sufficient to produce inflammation of this mixture. On the contrary, it would be quickly extinguished if exposed to such an accumulation of gases in a mine.

It should not be assumed that the extinction of a lamp exposed to such a mixture shows that the mixture is non-explosive. A Davy lamp will fill with flame and be extinguished in a mixture of gases and air that is highly explosive.

In regard to the 3 parts (3 per cent) carbon dioxide rendering the mixture non-explosive, it should be remembered that a firedamp mixture, at its most explosive point, requires one-seventh of its volume (say 14 per cent) to produce that effect.

In other words, it requires 14 per cent carbon dioxide to counteract the explosive qualities of 9½ per cent of methane. But, in the present instance, we have 5 per cent of explosive gases and but 3 per cent of carbon dioxide, which is but half sufficient to make the mixture safe.

In addition, it can be said that both carbon monoxide and hydrogen sulphide

are more readily ignitable than methane and their presence renders the mixture still more dangerous.

Armature

Kindly answer the following question in an early issue of *Coal Age*, and oblige a constant reader. If the diameter of an armature measures exactly 3 in. and its circumference is divided into twenty-one equal parts, what will be the length of a chord drawn between two of these points that are consecutive? **INQUIRER.**

_____, Pa.

The circumference of a 3-in. armature is $3 \times 3.1416 = 9.4248$ in. Dividing this into twenty-one equal parts

gives, for the distance between any two consecutive points as measured on the circumference, $9.4248 \div 21 = 0.4488$ in. The chord subtending this arc, however, is somewhat less than the arc itself and is calculated thus.

The angle measured by the arc between any two consecutive points is $360 \div 21 = 17\frac{1}{7}$ deg., or $17^\circ 8\frac{4}{7}'$. From a table of sines and cosines, the sine of one-half this angle is found; thus, $\sin 8^\circ 34\frac{2}{7}' = 0.1490 42/7$, which multiplied by the diameter of the armature gives the length of the chord joining any two of the consecutive points on the circumference. The length of this chord is therefore, $3 \times 0.14904 2/7 =$ say 0.44713 in.

QUESTION — Where employees are hauled to and from their working places in mantrips, state what precautions you would adopt and at what rate of speed the trips should travel?

ANSWER — A mantrip should always be in charge of a competent tripider or motorman, who should have orders to use every precaution to avoid accidents and to run slowly while the trip is passing over switches, on its way into or out of the mine. The trip should not be hauled at a speed exceeding six miles per hour. Before starting, it should be carefully inspected to see that the cars are properly coupled together. No explosives or tools should be permitted to be carried by the men, except such tools as can be placed in the bottom of the car, where they will be out of the way and in no danger of being caught and injuring the men while proceeding into the mine. Under no conditions should explosives, in any form, be carried by the men or hauled into the mine on a mantrip. Should the trip have to ascend an incline, the last car should be provided with a dog that would derail the cars, in case a coupling failed or the power went off the line.

QUESTION — In working a dusty mine where marsh gas is given off and fire-damp generated, what steps would you take to guard against accidents from explosions?

ANSWER — The mine should be well ventilated with a volume of air sufficient to dilute, render harmless and carry away the gas generated. Strict regulations should be made and enforced to prevent undue accumulations of dust, and means must be taken to prevent the raising of the dust and its suspension in the mine air. The mine must be carefully inspected at frequent intervals while the men are at work in their places. The work must be done by competent firebosses or safety inspectors equipped with approved safety lamps, and the miners should be equipped with electric cap lamps. No open lights must be permitted in the mine. Where the coal is blasted competent shotfirers should be employed, whose duty it will be to examine, charge and fire all shots that, in their judgment, are safe.

QUESTION — Why is moisture necessary in many of the mines of Alabama?

ANSWER — Any mine working a soft inflammable coal produces a quantity of fine dust that must be kept moist or in a damp condition to prevent its suspension in the mine air and eliminate as far as possible the chance of an explosion by reason of the ignition of the dust-laden atmosphere. The danger is greater if any appreciable amount of gas is present.

QUESTION — What conditions would guide you in determining the width of headings in rooms?

ANSWER — To insure safety and economy of working, depth of cover, thickness and inclination of seam, character of roof, floor and coal, method of working and the means employed to extract the coal must be considered.

Examination Questions Answered

Miscellaneous Questions

(Answered by Request)

QUESTION — What precautions would you adopt to reduce to a minimum the production and distribution of coal dust?

ANSWER — Make and enforce strict rules regulating the blasting of coal, which should be done by competent shotfirers using only permissible powder. The shotfirers should be authorized to examine, charge and fire all shots that, in their judgment, are safe and will not unnecessarily shatter the coal. Where miners are permitted to charge their own holes the kind of powder used and weight of charge should be clearly specified. Each miner should be permitted to take into the mine only what powder he will require for the day's work. Special instructions should be given each miner in regard to placing his shots. All shots should be mined and sidecut wherever necessary, in order to give the powder a chance to perform its work.

To prevent undue distribution of the dust in the mine, all roads and passageways should be regularly cleaned and no accumulation of dust should be permitted in the working places. In a dry and dusty mine, there is an advantage in using salt mixed with the stemming used for tamping the holes. Good results have been obtained by making up one dummy of salt to be placed next to the charge of powder. This salt is blown into the mine air when the shot is fired. Its absorption of moisture from the air has been found to keep the dust in a damp condition.

QUESTION — If you were in charge of a mine would you consider it dangerous if dry and dusty at the working face, provided no gas had ever been detected in that section?

ANSWER — A dry and dusty mine must always be regarded as a dangerous proposition, unless special precautions are taken to dampen the dust to keep it from being distributed throughout the mine and avoid its suspension in the air current. An atmosphere laden with dust is explosive, at times even when no gas is present; but the presence of gas always increases the danger.

QUESTION — (a) What method of timbering would you adopt in a seam where the roof and bottom are hard? (b) Where the roof is hard and the bottom soft? (c) Where both roof and bottom are soft? State your reasons.

ANSWER — (a) Where both roof and bottom are hard, some means should be employed to allow for the first settlement of the roof when the coal is taken out as the face advances. One plan is to set each post on a mound of slack or other soft material that will yield in the first settlement. Another plan often adopted is to taper one end of the posts. The furring of the wood, on the tapered end, prevents the destruction of the post when it takes the weight.

(b) When setting a post on a soft bottom a mudsill should be used to prevent the post sinking into the bottom. In this case, as in the first instance also, a soft cap-piece should be used above the post.

(c) When both the roof and the bottom are soft a good plan is to set the post on a mudsill, at the same time placing a good crossbar against the roof and above each post; or use, instead, a wide and long cap-piece of hard wood that will distribute the pressure over a larger surface on the roof.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

EMPLOYMENT conditions in different sections of the country are revealed, in the Federal Reserve Board's report on business conditions, in part as follows:

"Reports received from the various districts concerning developments in the labor situation during the past month are of a somewhat conflicting character. The latest statements issued by the U. S. Employment Service covering firms employing more than 500 workers show that for the period ending Jan. 1 there was an increase of 4.2 per cent in numbers employed as compared with the end of December.

. . . The net increase in numbers employed amounted to 63,400 for the 1,428 reporting firms which were employing 1,556,507 workers on Jan. 31. Since the date of this report, conditions have arisen which have brought about increases in unemployment in certain sections of the country, notably in District No. 1 (Boston), where widespread strikes in the textile mills of Rhode Island and New Hampshire are now in progress.

"In New York State there was a slight decrease of 1.5 per cent in the numbers employed in 1,500 establishments which made reports to the State Department of Labor. The decrease was attributed mainly to seasonal reductions and the closing of factories for repairs. In District No. 3 (Philadelphia) a large number of unemployed was still reported for the six cities of Altoona, Harrisburg, Johnstown, Philadelphia, Scranton and Williamsport, according to the Pennsylvania State Department of Labor. The number of unemployed rose from 232,960 on Feb. 1 to 234,275 on Feb. 15. However, this is an improvement over conditions on Jan. 1, when there were 243,293 unemployed.

"District No. 5 (Richmond) reports that during the past month there has been some evidence of an increase in the numbers unemployed. Street car strikes have been in progress in Richmond, Norfolk and Portsmouth and one has been called in Columbia, S. C. A number of shipyard employees have been laid off in Newport News.

"Special reports made to the Federal Reserve Bank of Chicago show that at the end of January there was an increase of 4.3 per cent in numbers employed by reporting firms as compared with the end of December, although a decline of 5.8 per cent as compared with a year ago occurred. The inquiry covers 205 firms which employed 116,277 men on Jan. 31. The increases in employment were exceptionally heavy in the case of automobiles and accessories, metals other than steel and iron, and agricultural machinery. The respective percentages were 126, 15.1 and 15.2.

"In District No. 9 (Minneapolis) conditions improved during the month of January and special reports made to the Federal Reserve Bank of Minneapolis covering firms employing less than 500 men in Minneapolis and also including mining and lumbering companies in the district showed an increase of 8.2 per cent in numbers employed.

"In District No. 12 (San Francisco) also there were practically no changes during the month of January. In California, Oregon and Washington there was reported to have been 'an improvement in outlook.' Increased activity in lumbering and other industries was absorbing some of the unemployed forces of the district, and in Arizona, Nevada, Idaho, and Utah an increase in mining activity especially in the copper mining districts had occurred. On the other hand, railroad and construction work were reduced in scope."

Railroads Order Equipment

The Baldwin Locomotive Works has received a contract for forty-seven locomotives from the Chicago, Burlington & Quincy R.R. The order is valued at \$2,000,000. The Florida East Coast R.R. is reported to have placed an order for ten locomotives with the American Locomotive Co. It is also reported that the road contemplates ordering additional equipment as soon as specifications are in hand.

The directors of the Pennsylvania Railroad Co. have ordered the purchase of 250 new steel cars for passenger service. With the 20 steel dining cars for which orders were recently placed, this means that the Pennsylvania system will be augmented by a total of 270 cars of all-steel construction, which constitutes the largest order for steel passenger cars placed by any railroad so far this year. One of the road's subsidiaries which has operated under separate management, the Long Island R.R., has ordered 50 new all-steel cars for delivery early this year.

Textile Mill Cuts Work Schedule

The Farr Alpaca Co., Holyoke, Mass., the largest textile concern in the vicinity, reduced its working schedule March 7 from six to four days a week, the new schedule to continue until further notice.

Tin Plant Ready to Resume

Operations at the bar mill and open-hearth furnace departments of the N. & G. Taylor tin mills at Cumberland, Md., were reported March 9 to be about to resume in a few days, after a suspension of about a year.

Typewriter Factory Busier

The Royal Typewriter Co.'s factory at Hartford, Conn., has increased its operating schedule 15 per cent. Many of its employees are now on full time.

American Woolen Co. Mills Hum

In connection with the annual report of the American Woolen Co., which shows earnings of \$16 per share, it is reported that orders on hand are sufficient to keep the mills of the company operating into the summer months.

Workers in Detroit Double in Year

The number of workers employed in the chief industries in Detroit has almost doubled since March 1, 1921, according to a report made public by the Employers' Association. An increase of 8,864 workers was shown for February, as compared to January of this year. The total employed by the seventy-nine manufacturing concerns holding membership in the association was given as 121,763, as against 62,878 a year ago. These plants normally employ 200,000 workers.

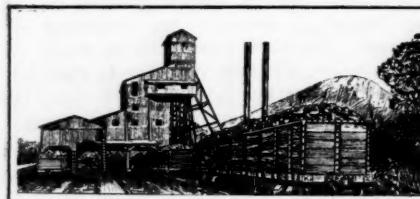
Shows Distribution of Costs Per Ton in Supplying Coal to Twin Cities

DISTRIBUTION of costs per ton in supplying Minneapolis and St. Paul, Minn., with West Virginia splint lump coal via the Duluth-Superior docks is graphically shown in a circular entitled "The Coal-Dock Dollar," an idea conceived and illustrated by William H. Groverman. The circular, illustrations from which are shown here-with, is distributed by the Berwind Fuel Co., Minneapolis, Minn., with which Mr. Groverman is now associated.

The cost of the coal at the mines, according to Mr. Groverman, represents 30.98 per cent of the price to the retailer, transportation is responsible for 55.14 per cent and dock operating and selling account for the remaining 13.88 per cent.

A ton of splint lump, the circular states, costs \$2.50 at the mines in West Virginia. Freight charges from the mines to Lake Erie amount to \$1.84 per ton, dumping into vessel at this stage costing 8.5c. additional. From Lake Erie to the Duluth-Superior docks the boat transportation charge represents 50c., dock operating and selling involving a further expense of \$1.12. Finally, from Duluth-Superior to the Twin Cities the expenditure for freight amounts to \$2.02 $\frac{1}{2}$. For other destinations than Minneapolis or St. Paul the latter charge, of course, will vary. Incidentally, the circular notes, three tons of rescreened lump will produce about one ton of screenings.

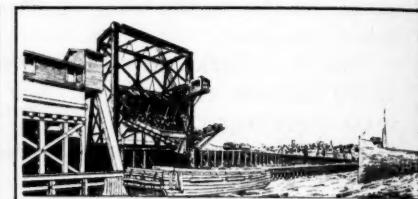
PICTORIAL SUMMARY OF ITEMS OF COAL COSTS IN THE NORTHWEST, FROM MINE TO RETAIL YARD



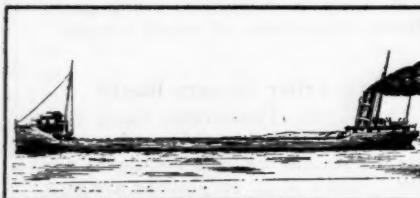
AT THE MINE WEST VIRGINIA SPLINT LUMP COSTS \$2.50 PER TON



RAIL FREIGHT FROM WEST VIRGINIA TO LAKE ERIE, \$1.84 PER TON



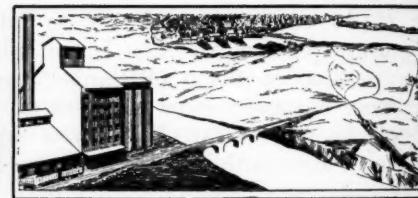
DUMPING THE COAL FROM CARS INTO BOATS, 8.5C. PER TON



FOR 1,000 MILES ON THE LAKE, BOAT FREIGHT IS 50C.



HANDLING CHARGE AT UPPER LAKE DOCKS IS \$1.12 PER TON



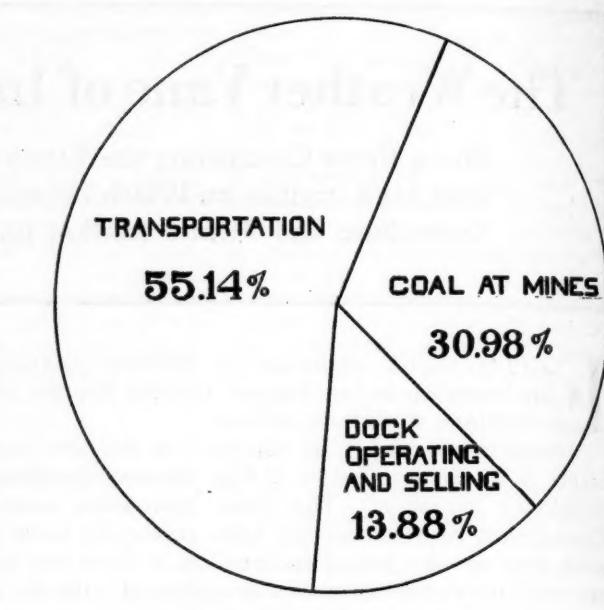
FROM DULUTH TO THE TWIN CITIES RAIL FREIGHT \$2.02 $\frac{1}{2}$

Operators in Canadian Rockies End Meeting With Miners and Will Post Lower Scale

NEGOTIATIONS between the Western Mine Operators' Association and the scale committee of District No. 16, United Mine Workers of America, broke up abruptly half an hour after the commencement of a conference, March 4, between the two. No wage agreement could be reached and the conference adjourned sine die. R. M. Young, who is commissioner for the operators' association, said the decision was final. The scale presented to the mine workers at the meeting embodied reductions of from 30 to 50 per cent, and this scale will be posted at the mines of the individual companies, to become operative on April 1, when the present contract shall have expired.

February Hard-Coal Movement Exceeds That Of January by Nearly 400,000 Tons

SHIPMENTS of anthracite during February, as reported to the Anthracite Bureau of Information, Philadelphia, show a substantial increase over the two preceding winter months, for although a shorter month by the calendar, and



How the dollar paid by the retail dealer in the Twin Cities for a ton of West Virginia splint is divided between cost of coal and of transportation, including boat haul and dock operating charges.

containing two legal holidays—Lincoln's and Washington's birthdays—the quantity of anthracite shipped amounted to 5,239,014 gross tons, as compared with 4,848,053 tons in January and 4,635,922 in December. More seasonable winter temperature than obtained during January and the making of provision against the possibility of a shortage, should a suspension occur on April 1, both contributed to the increased activity.

Shipments by originating carriers were as follows, in gross tons:

	February 1922	February 1921	January 1922
Philadelphia and Reading.....	1,160,685	1,170,753	1,052,872
Lehigh Valley Railroad.....	857,579	1,063,508	766,602
Central Railroad of New Jersey.....	537,214	515,551	542,558
Delaware, Lackawanna and Western Railroad.....	755,923	920,788	744,768
Delaware and Hudson Company.....	670,323	813,191	619,762
Pennsylvania Railroad.....	402,762	426,350	331,871
Erie Railroad.....	492,262	633,706	466,495
New York, Ontario and Western Ry.....	141,929	153,017	101,779
Lehigh and New England Railroad.....	220,337	269,237	221,346
Totals.....	5,239,014	5,966,101	4,848,053

ATTORNEY-GENERAL DAUGHERTY has invited Hoover to join in an effort to lower retail prices. Why not extend an invitation to retailers to participate?—San Antonio Light.

Coal Freights to Be Substantially Cut, Is Belief; Butler Quotes Hoover for Reduction

IT is a foregone conclusion that the Interstate Commerce Commission will order a reduction in the freight rates on coal. About 300 witnesses appeared during the general rate reduction hearing. Every important industry was represented, as were the consumers and the public generally. One-sixth of those appearing expressed positive convictions that coal rates should be reduced materially. Only one of the fifty asking for such a reduction represented coal producers. In view of a nation-wide unanimity of opinion that coal rates should come down, there is a general belief that the reduction will be a substantial one.

The importance of the hearing, which has just been concluded, is indicated by the fact that 8,275 pages of testimony were taken down stenographically and typewritten for the use of the commission. In addition there were more than 500 exhibits, many of them quite elaborate.

In summing up the position of the National Coal Association, Rush Butler, its counsel, among other things, told the commission:

"Difficult as it may be to measure with accuracy the beneficial result of a reduction in coal rates, the conclusion is inescapable that without such reduction, a revival of business and industry in the United States is impossible. That all industry is awaiting reduced transportation charges for fuel is demonstrated by the testimony of many witnesses heard in this proceeding. You have listened to the plea for reduced rates on coal presented by the Associated Industries of Massachusetts, by numerous representatives of the iron and steel industry, by representatives of the brick and tile industry, by manufacturers of glass, paper and many other commodities and by the Board of Railway Commissioners of South Dakota, representing the people of that agricultural state. From every section of the country comes the statement that reduced rates on coal will be more helpful than any other reductions that can be made."

COAL INDUSTRY DOES NOT TAKE SELFISH POSITION

"For the reasons heretofore assigned I do not feel in discussing this problem on behalf of coal that that industry is assuming a selfish attitude in this proceeding. To a greater extent than any other commodity coal is used, both directly and indirectly, by the people of this country. If it is not used by them directly, for the purpose of light, fuel or power, it is necessary to their daily life in the production of the food they eat and the clothes they wear. The proposition which I wish to advocate to this commission was clearly and forcefully stated by Secretary Hoover when he said:

"If I were examining the freight rates I should at once say that coal, metals, wood and agricultural and other producer's goods should be reduced to the bottom before l.c.l. or class rates are touched. . . . An economic analysis of our industry will show that l.c.l. and class rates are far too low compared to the rates on primary commodities."

"Certainly this declaration was not made by the Secretary of Commerce as the special representative of or spokesman for the coal industry. It is the uncontroversial declaration of a man of high economic authority. Please note that he lays emphasis upon the fact not merely that coal rates should be reduced, but that they should be reduced 'to the bottom before l.c.l. or class rates are touched.' That this is a studied declaration is not to be doubted. It is the teaching of experience. And so I urge upon this commission, not on behalf of the coal industry but upon behalf of a suffering public : (1) That a substantial rate reduction be made; (2) that the first rates to be reduced be those applicable to the movement of coal; (3) that every coal rate in the United States be cut not by a mere 5 or 10 per cent but substantially, 'to the bottom'; (4) that these rates be cut immediately to that extent; (5) that this be done whether any other rates be reduced or not. The benefits that will follow from such action on your part will depend upon the depth of the cut and how soon it is made. A trifling reduction

would be of no value and a delayed reduction would be less promptly and helpfully effective.

"It seems to be the consensus of opinion of the citizenship of this country that it is within your province and within your power by the entry of your final order herein to afford relief from industrial depression to a degree that cannot be equaled by any other one action of man or government. I believe this view is justified."

Mine Materials Cost Little Less Now Than They Did at War Peak

MATERIALS and supplies a coal mine uses have not shown any sudden drop in cost since the price aviation of 1920, according to a study of the subject made by the Illinois Coal Operators Association. Whereas these costs totaled 11c. per ton of coal mined in 1915 and 41 $\frac{1}{2}$ c. at the height of high prices, they are still exceedingly high, as the accompanying table covering some of the items of materials and supplies shows.

In presenting its figures the association calls attention to the fact that powder and blacksmithing, both of which might seem, at first thought, to be items of small consequence in the ultimate cost of coal, manage to find ways to become quite formidable among mine costs.

Although explosives are considered "tools of the trade" which every loader is supposed to provide at his own expense, in consideration of the tonnage rate paid him, the operators nowadays are compelled to pay part of their cost.

COMPARATIVE COST OF COAL MINING MATERIALS, 1913-1922

	1913	1920 War Peak	1922
Fuel, coal—screenings, per ton	\$0.60	\$3.50	\$2.50
*Electric energy (average) at Mine Board, per kw.-hr.	.01 $\frac{1}{2}$	.02 $\frac{1}{2}$	.02 $\frac{1}{2}$
Mine Locomotive, 15 tons, each	2,700.00	8,400.00	7,000.00
Mine Locomotive, 8 tons (1915), each	3,160.00	6,053.00	4,902.00
Chain Breast Machine—19A, each	1,100.00	2,400.00	2,250.00
Mining Machine—Sullivan CE-7, each	1,750.00	4,000.00	3,750.00
Steel rails; per ton	25.00	70.00	35.00
Bar steel, warehouse, per cwt.	1.65	4.17	2.53
Copper wire, base, per lb.	.14	.28	.16 $\frac{1}{2}$
Copper bonds—00 fig. 8, each	.26	.47 $\frac{1}{2}$	.38 $\frac{1}{2}$
Powder, black 2f, per keg, 25 lbs.	1.00	2.25	1.90
Permissible explosives—nitro base, per cwt.	9.00	16.35	14.35
Permissible explosives—ammonia base, per cwt	11.75	22.75	18.10
EB caps no. 6—8 ft., per c.	3.00	7.70	6.60
Blasting caps (1917), per M.	12.75	16.13	12.00
Crescent fuse (1917), per M.	5.63	9.37	7.56
Lumber (pit car) white oak per M	27.50	55.00	45.00
Lumber (bratties)	22.50	36.00	27.00
Timbers—12-ft. white oak bars, each	.50	1.47	1.25
8-ft. props, each	.16	.41	.32
5x6x5 $\frac{1}{2}$ ties, each	.20	.40	.32
Lubricants—engine oil, per gal.	.12	.36	.28
cylinder oil, per gal.	.28	.56	.47
black oil, per gal.	.06	.19	.17
Pit cars, each	\$48.00	\$200.00	\$135.00
Pipe (2-in.), per ft.	.08	.22	.12
Supplies—shovels, per doz.	5.50	15.00	10.75
drills, each	5.50	12.00	10.00
blasting paper, per cwt.	3.50	11.00	7.25
Overhead line materials—			
Hangers, each	.18	.60	.59
Clamps, each	.15	.45	.31
Sectional switches, each	2.75	7.75	9.00
Hoisting rope (1 $\frac{1}{2}$ -in.), per ft.	.15	.38	.30 $\frac{1}{2}$
Track spikes (base), per cwt.	1.65	5.40	3.25
Cement (portland), per bbl. net	.88	2.77	1.82

*Electric energy purchased from local power companies has, during and since the war period, been advanced upon authority of the State Commission 75 per cent and still continues at this high level.

Hardwood Men May Form New Association

THE American Hardwood Manufacturers Association, in convention at Louisville March 7, according to a news story, contemplates disbanding the present organization and forming an institute under which statistical information can be legally gathered and distributed in conformity with the recent decision of the Supreme Court. The court held that the former method of gathering statistics was in violation of the anti-trust law because they were made available only to the seller.

Supreme Court Dismisses Howat Plea Against Kansas Industrial Court

IN a unanimous opinion, delivered by Chief Justice Taft, the U. S. Supreme Court, on Monday, March 13, dismissed the writs of error sought by Alexander Howat and other Kansas coal-mine labor leaders against the constitutionality of the Kansas Court of Industrial Relations Act. In its decision the court said the Kansas Law created an administrative board and not a court and that the state had power to create such a board, citing the creation by Congress of the Interstate Commerce Commission to regulate transportation.

The union contended that the act seeking to create the Court of Industrial Relations was arbitrary, oppressive, unreasonable and unjust discrimination, in violation of the Fourteenth Amendment; that it was a penal statute that was vague, indefinite and uncertain and an unlawful restraint on commerce; that it commingled the function of the three great departments of the government; that it contravened the Clayton Act and the Lever Act; that it empowered the Court of Industrial Relations to fix wages, hours and working conditions, take over and operate industries, and generally to install a system of state socialism, all in violation of due process.

The sections of the act which were held to be void are so intermingled with other sections, the union alleged, as to cause the whole act to fall.

Blames Operators for High Coal Prices; Urges Federal Collation of Cost Data

IN a speech in the House of Representatives on March 7 Representative Walter H. Newton, of Minnesota, attacked coal operators, both bituminous and anthracite, for maintaining high coal prices. He produced tables showing the income of coal companies from 1912 to 1919, prepared by the Federal Trade Commission and W. Jett Lauck. He advocated that authority be conferred upon a government agency to collect current information as to cost of production in the coal industry, and criticized the coal industry for instituting court suits to prevent the Federal Trade Commission from gathering such data.

SOME MINER.—*Rastus*: Hello, Sam. Working?

Sambo: Sure; ah's a miner now.

Rastus: Coal miner?

Sambo: No, man; ah's a kalso-miner.

Mine Fatalities in January Were Fewer in Number and Ratio to Output

ACCIDENTS at coal mines during January caused the loss of 146 lives, according to reports by the U. S. Bureau of Mines. During the same month in 1921 there were 197 fatalities. The decrease of 51 fatalities represents about 26 per cent. Based upon an estimated production of 43,955,000 net tons of coal in January, 1922, the fatal-accident rate was 3.32 per million tons mined, as compared with 4.13 for January, 1921, when the output of coal was 47,680,000 tons.

COAL-MINE FATALITIES DURING JANUARY, 1922, BY CAUSES AND STATES
(Compiled by Bureau of Mines and Published by *Coal Age*)

State	Underground										Shaft			Surface			Total by States
	Falls of roof (coal, rock, etc.).	Falls of face or dollar coal.	Mine cars and locomotives.	Gas explosions and burning gas.	Coal-dust explosions (including gas and dust combined).	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Cage, skip, or bucket.	Other causes.	Total.			
Alabama.....	6	1					2									9	4
Alaska.....															0	0	
Arkansas.....															0	0	
Colorado.....	1	2	4	3	3	1									3	4	
Illinois.....			2												16	15	
Indiana.....															7	10	
Iowa.....															0	3	
Kansas.....			1		6										1	1	
Kentucky.....	4														11	19	
Maryland.....															0	2	
Michigan.....															0	3	
Missouri.....															0	0	
Montana.....															0	0	
New Mexico.....															0	0	
North Dakota.....															0	0	
Ohio.....	2	3	1	1	1	1									1	9	
Oklahoma.....															0	1	
Pennsylvania (bituminous).....	11	5	3		1				1	21					1	23	
South Dakota.....															0	0	
Tennessee.....															0	0	
Texas.....															0	1	
Utah.....		2	1							3					3	4	
Virginia.....															0	2	
Washington.....			1							2					2	1	
West Virginia.....	8		6				1	1		16					1	17	
Wyoming.....										1					1	5	
Total (bituminous).....	43	9	22	4	9	4	4	2	1	98					1	4	
Pennsylvania (anthracite).....	15	5	7	2	5				1	35	1				3	44	
Total, January, 1922.....	58	14	29	6	9	9	4	2	2	133	1				1	12	
Total, January, 1921.....	101	8	40	4	9	15	3	7	178	1				4	517		

In California, Idaho, Nevada, Georgia, North Carolina and Oregon there were no fatalities in 1921. These states have no coal-mine inspectors. Reports are obtained from operators at close of year.

Farrington Slow to Accept Illinois Operators' Bid to State Wage Parley; Deadlock Still Holds

BY E. W. DAVIDSON

EVENTS of the past week have not materially changed the coal-mine labor situation in the West. Frank Farrington, Illinois district president of the United Mine Workers, urged by the operators either to accept or reject at once their invitation to a wage conference, replied at the end of the week that his answer would be forthcoming after his state executive board meeting, on the 15th. This delays possible action for a separate state wage agreement, so that it now seems physically impossible for such an agreement to be made in Illinois in time to avert a general strike April 1.

It is common opinion among Chicago coal men that Farrington has no intention of meeting the Illinois operators until after a strike has been called. By that delay he would ostensibly be staying in the International union ranks. He has already used the operators' invitation to enable him to take a verbal crack at his dear enemy President Lewis of the International, and there is a feeling that he will somehow manage to use it adroitly to embarrass Mr. Lewis further. Then, after the strike has been called, he is expected to get right down to the business of winning as good a separate settlement with the Illinois operators as possible.

Early in the week Farrington lived up to expectations in the answer he wired to President Lewis' telegram which had "advised" that Illinois miners not undertake negotiations for a separate settlement. It seems that Lewis' "advice" was just what Farrington hoped for. It gave Farrington the chance for this come-back, in which he termed Lewis' "advice" as "presumptuous and impudent":

We regard the release of your telegram to the press as a plain attempt to put the Illinois mine workers in a false position before the mine workers of the country.

We do not intend to drift into a strike merely for the purpose of allowing some of us to get our pictures in the movies, in the face of the fact that a meeting with the Illinois operators may bring about a satisfactory agreement and one that will save our membership from a demoralizing and disastrous strike.

The action of the international board is presumptuous, because that body has presumed to function on a matter that comes clearly within the province of the policy committee created by our recent international convention.

The trouble is that President Lewis and the International executive board have failed to differentiate between negotiations for an agreement and concluding an agreement. Under the thirty-second section of our state contract we are obliged to enter negotiations, but we are not obliged to conclude an agreement and we have not asked for authority to do so, and we have not even implied that we intend to do so.

The Illinois operators waited the rest of the week for Farrington to reply to their invitation, which had tossed this new bone of contention between Lewis and the Illinois king of coal labor. On Friday they wired to Farrington, urging an immediate reply, thus:

Illinois operators again call your attention to the fact that they would like to secure the adjustment of a new contract with the miners if it is at all possible before the expiration of the present agreement.

For almost three months now—to be exact, since Dec. 17—we have done everything possible to get negotiations under way. We have met fully and completely every contract requirement to secure conference, but continue to be absolutely denied any opportunity to discuss the subject of wages with the representatives of our employees.

We do not propose to be held at fault if there is a strike or cessation of work at Illinois mines after April, nor to lend our assistance in the slightest degree to others that may contemplate the enforcement of such a policy.

As a matter of fact we are not concerned with the internecine difficulties of your International union organization, which so far as Illinois is concerned has not justified itself by seeking to compel our continuing acquiescence in its present policy, after we have fairly secured the right to negotiate in our own state, having twice promptly consented to join in a four-state committee meeting to consider the possibility of arranging for a larger conference body.

In previous years we have always been granted the right to elect where and how we would negotiate. No state participating in these joint conferences during the past score or more years has ever sought to compel others to join them. Participation has always been voluntary.

The really serious part of getting a new scale and working agreement should not be in getting started but rather in reaching an understanding of just how we can meet the competition of coal originating at mines where they have no unions and where the operators are not confronted with difficulties such as are herein recited.

Under these circumstances and in view of the now apparent certainty that the proposed four-state committee meeting which continues to be demanded will, if and when held, yield nothing

in the way of securing a subsequent four-state conference, why should we not proceed with negotiations here in Illinois?

Ten days ago we asked for a meeting with you and the Illinois executive board and suggested Chicago, March 8, as a place and time of meeting. This suggested date has come and gone and we have no reply from you whatever. We insist upon your immediate acceptance or rejection of our proposition.

This brought Mr. Farrington's reply that the decision would be made at the state executive board meeting, on the 15th.

The view in Chicago is that labor is still counting heavily on the government succeeding in getting miners and operators together in spite of the reported refusal of the Pennsylvania operators to attend such a conference. It is difficult to imagine such a conference would result in anything but a new statement of their cases by both sides, but the belief is that labor hopes to manipulate the conference so that something resembling the old government coal commission can be established. From such a board labor would fondly hope to get a far better wage decision than could possibly be gotten by states.

The Illinois operators, who consistently offered to meet labor in the four-state group until President Lewis, getting only "Noes" from Eastern operators, called off one proposed conference after another, now take the position that a four-state conference would be of no avail because "Mr. Lewis and his executive associates are not in position to complete a wage agreement and scale at the present time. They have no latitude in which to do so and can only present the demands adopted at the recent miners' convention. If the miners' referendum now being taken shall so authorize, there would be no other procedure for Mr. Lewis to follow, if these demands are denied by the operators, than to declare a strike by his entire membership. Of what avail," concludes the Illinois producers' statement, "is a joint four-state conference under such circumstances? And why the arbitrary denial of separate negotiations?"

There still is no indication that Indiana is getting ready to follow Illinois. John Hessler, president of District 11 of the miners, declared the Indiana miners would not bolt the convention program. There was no suggestion of a proposal from the Indiana operators.

The miners' union tried to make it plain that the conference last week between the Kansas, Missouri and Arkansas-Oklahoma districts of the mine organization with Southwestern operators was held only to enable the miners to formally present the convention demands and that no defection in union ranks was developing there.

Pittsburgh and Ohio Operators Reiterate Their Position

Efforts of Secretary Davis to Arrange Interstate Meeting with Mine Workers Does Not Change Attitude of Producers

SECRETARY DAVIS' effort on March 9 to induce the operators of the Central Competitive Field as a group to meet the United Mine Workers brought forth replies from the operators but did not change the position of any of them. It went further, indeed, for it drew the fire of the central Pennsylvania operators, the most important of the "outlying" fields.

Pittsburgh on March 9 summed up its position in these words: "Our decision has been reached. We will deal with our own men in western Pennsylvania, union or non-union, on a working agreement, with the exception of the check-off, but we will not be a party to a scale for Ohio, Indiana and Illinois. Our position is irrevocable." In explanation of this position the Pittsburgh operators point out that in their opinion the practice of central field wage

determination, used as it is for the county as a whole, is economically unsound. The miners insist upon it because it helps maintain a control of miners' wages in both the United States and Canada. The producers further state that: "The aim of the miners is to force a non-competitive coal market so that wages may be maintained at an unusually high level."

Eastern Ohio operators renewed their willingness to join a central field negotiation, providing all fields come in. Illinois has repeatedly so stated her position and, of course, Indiana would adopt the same course.

Southern Ohio, from the start, has been willing to meet the miners locally but not as a part of an interstate negotiation. The letter of W. D. McKinney, secretary of the Southern Ohio Coal Exchange, to Secretary Davis dated Columbus, March 11, states the case of operators in that field fully, as follows:

"The operators of southern Ohio cannot participate in wage conferences with operators and miners of other states, but they will meet with the representatives of the mine workers of this district at any time to discuss a wage scale and working conditions that are fair to the miners and operators of southern Ohio and that are in accord with public welfare and demands and sound policy. The economic and competitive conditions in southern Ohio are in no way identical with the other districts with which they are asked to participate and neither the miners nor operators of southern Ohio could justify any agreement that may be arrived at in such a joint interstate meeting as suggested.

"The demands of the United Mine Workers are practically the same as those which have been presented to and rejected by every interstate conference which has been held in the last three years—at Buffalo, Oct. 2, 1919; at Philadelphia, Oct. 9, 1919; at Washington, Oct. 21, 1919, in conference called by Secretary of Labor Wilson at the request of President Wilson, followed by the strike of the miners in violation of the then existing agreement. These demands were also rejected by the Bituminous Coal Commission, and on March 31, 1920, a new agreement was made, based on the finding of that commission, to cover the period of two years ending March 31, 1922. In August, 1920, four months after that agreement had been made, the United Mine Workers asked for an interstate conference, which was convened at Cleveland, Aug. 13, 1920, at which conference the miners demanded an increase of \$2 per day for day work and an increase of 10c. a ton for mining, also modification of other basic provisions of the contract. After a five-day conference the miners and operators could not agree and the whole matter under consideration was referred to the various districts for their action, thereby disrupting the four-state agreement.

REJECTION OF MINERS' DEMANDS DISRUPTS AGREEMENT

"The rejection of the miners' demands by the interstate conference at Cleveland in August, 1920, now renewed, disrupted the interstate movement and at that time was so considered by the United Mine Workers themselves.

"The Ohio operators met with the Ohio miners in Columbus on Aug. 28, 1920, at which meeting the miners' representatives informed the operators that unless an increase of \$1.50 per day in the day wage scale was granted the operators would have to assume the responsibility for the closing of the mines. This was followed by a district agreement making an advance of \$1.50 per day for day workers. The same process was followed by other states. Thus the present wage scale, the continuation of which is demanded by the United Mine Workers, is, in so far as the day wage scale is concerned, based on a district agreement and not on a interstate agreement.

"The present demands have been rejected by every tribunal to which they have been presented. On the other hand, the United Mine Workers have violated every agreement made by them since April, 1916, and we cannot consistently attend any further conferences with the representatives of an organization that has so thoroughly demonstrated its inability and unwillingness to keep its four-state contracts.

"You understand, of course, that the method of arriving at wage scales by interstate agreement has been challenged in the federal courts as a violation of the Sherman Anti-Trust Law.

"In conclusion, permit us to repeat our assurance that the operators of southern Ohio will be glad to confer with the representatives of their employees at any time to discuss a wage scale and working conditions, with the understanding that it will not include the check-off."

The scale committee of the Northern West Virginia Coal Operators' Association and C. F. Keeney, president of District No. 17, United Mine Workers of America, will begin negotiations in Baltimore March 25 for a new wage scale for the northern West Virginia field. This was agreed to at a meeting in Baltimore Monday, March 13, between the committee and Mr. Keeney.

The members of the scale committee assembled in Baltimore Monday expecting to begin wage negotiations with Mr. Keeney, who, the operators said, had accepted their invitation to confer with them. Mr. Keeney told the committee that he first wanted to have the question discussed at his union convention at Charleston, W. Va., on March 21. He suggested a conference with the committee on the 25th, to which the operators agreed.

Union miners of the Pittsburgh bituminous coal field were invited on March 13, by the Pittsburgh Coal Producers' Association, to meet with it on March 20, to "negotiate a wage scale for the mines in the Pittsburgh district."

Central Pennsylvania Operators Oppose Interstate Settlement

As Chief Competitors Are Non-Union Fields, They Hold That Rates Paid There Should Be Basis of Scale

ACTING through the Central Coal Association central Pennsylvania operators on March 10 wrote Secretary Davis opposing the principle of an interstate wage settlement to which they are not party but by which they are bound. Pointing out that the central Pennsylvania field produces in excess of 10 per cent of the total soft coal output in the United States, G. Webb Shillingford, president of the association, said that these interstate conferences have in the past been the means of setting up a monopoly of union labor regardless of competitive conditions. All the great fields in the East and competitive with central Pennsylvania, he pointed out, are now non-union, and it is upon the rates in those fields, not the Central Competitive Field, that central Pennsylvania mine wages must be based.

Mr. Shillingford says:

"The present policy of the United Mine Workers of America prohibits any agreement being reached in the outlying districts until an agreement has been consummated in the Central Competitive Field. This means that the miners of central Pennsylvania will be ordered to suspend work on April 1 without having had the authority to negotiate a new wage scale.

"The Central Coal Association has repeatedly requested the officials of the United Mine Workers of America of this district to meet them and discuss a revision of wages to meet economic conditions, but in each instance this request has been refused, such refusal having been directed by the national president of the United Mine Workers of America. However, the members of the Central Coal Association still stand ready to meet the representatives of their employees, whether union or non-union, in order to negotiate a new schedule of wages and rules to take the place of the one expiring on March 31, 1922.

"We respectfully urge the administration to carefully consider in its very proper attempt to avoid a strike that it does not further complicate the situation and handicap the efforts of responsible operators who are endeavoring to get themselves in a position where they can treat with their employees in fairness and serve the public properly."

Only Temporary Advantage to Producers Seen in Local Wage Adjustments; Reserve Stocks Now a Menace

BY PAUL WOOTON

Washington Correspondent of *Coal Age*

THAT operators in other parts of the Central Competitive Field are worried over the prospects of an agreement in Illinois may be judged from the communications which are reaching Washington. In their desire to avoid a national agreement some operators apparently have lost sight of some of the disadvantages which will come to them if local settlements be made. While there is no question that better bargains can be driven in local settlements, attention is called to the fact that the operators have much to lose in any break in the solidarity among operators in union territory. The fact that the operators in the Central Competitive Field have been able to act as a unit has stabilized the situation and tended toward definiteness in costs. If they surrender the idea of fixing wages in the Central Competitive Field and then adjusting other scales to agree with it, another step will be taken in the progress of the disintegration which is going on—a trend so clearly indicated when F. S. Peabody withdrew from the National Coal Association.

There are other evidences that the whole bituminous industry is engendering a Balkan-like spirit. Everyone seems to be out to get everyone else. This trend is not confined to the Central Competitive Field. Other union groups are fighting among themselves. There is an inclination toward new alliances and new groupings, such as the announcement of the trans-Mississippi states that they would deal with their own miners without waiting to see what the Central Competitive Field will do. Many think that this is showing lack of reflection. If independent agreements are made in advance, the question is being asked how they will be able to bring their costs into adjustment with the Central Competitive Field when things jolt down to normal again. There is an increasing realization that there are arguments to support John L. Lewis' position that economic problems are nation-wide.

ANY AGREEMENT IN ILLINOIS MAY NOT BE PERMANENT

If the Illinois operators enter into an agreement with their miners, it is fully expected that it will not be a permanent or binding agreement. It seems apparent that state agreements will have to be temporary, so as to permit of readjustments after the action of competitors is known. There also is the freight rate reduction to be considered. When this item of cost comes down, competitive relationships will be changed again. It is pointed out that a sizable cut in freight rates at this time would have a far-reaching effect in the Central Competitive states. High freight rates have the effect of a protective tariff. They sequester most of the nearby market for the local producers. There is no doubt that the relatively favorable working time in Illinois has been a direct result of the high freight rates.

While there is a general feeling in administration circles and among coal specialists in Washington that an agreement in the anthracite fields is not at all improbable, it can be said that there is no single individual whose business it is to follow the coal situation who expects to see a strike avoided in the bituminous industry. While it was necessary to accumulate large stocks to prevent the union from winning the strike, those very stocks constitute a menace in that their owners want to use them up with the least possible loss. As a result there is many a consumer who is hoping the strike will materialize.

Most of the operators are welcoming the "showdown." The miners have little to lose and their leaders know that the strike is a necessary step before the rank and file in the union develops a psychology sufficiently plastic to consider the question rationally. In this connection, however, it can be said that if the strike is avoided, activity in the bituminous industry will drop to new low levels.

On March 9 Secretary of Labor Davis made the first official public announcement that he was seeking to persuade the operators and miners in the Central Competitive Field to confer on a new wage agreement prior to the expiration of the present contract.

The Secretary's announcement follows:

"Secretary of Labor Davis is in direct communication with representatives of the coal operators of the Central Competitive states—Indiana, Illinois, Ohio and western Pennsylvania. It is his earnest desire that both the miners and operators carry out the spirit and intent of the resolution adopted at the New York conference of March, 1920, which provided for a preliminary conference to meet prior to April 1, 1922, to arrange a time and place for a meeting to take up and consider the making of a new agreement.

"The Secretary's action is heartily approved by President Harding. None of the government officials in touch with the threatened coal situation can see any objections to a council table gathering of those directly interested in the bituminous coal industry, and particularly in the present situation, when it is a part of the last agreement and in line with long-time practice in the coal industry.

"Joint meetings such as that of the anthracite operators and miners called for New York City, March 15, give to each side an opportunity to go into every phase of the disputed factors, and can only result in better understanding. The course suggested by Secretary Davis is only an expression of the earnest conviction of the public, as is evidenced by scores of editorials in the leading newspapers of the country, that until such meeting is held in accordance with a previous understanding the two sides to the coal situation have not discharged the obligations resting upon them.

"The government has no desire to interfere unduly, but, having not only the interests of the employers and employees in mind, it also has a duty to safeguard the interests of the people, who will be seriously affected by the suspension of coal mining.

"Secretary Davis cannot see why, in the interests of common sense, the two sides to the coal controversy cannot get together, adjust their differences, and save the country from the costly results of a strike."

NOT MUCH IMPORTANCE ATTACHED TO DAVIS' EFFORTS

Little significance seems to be attached to the activities of the Secretary of Labor. It is recognized that he is doing just what he is expected to do under such circumstances, but the situation is such that nothing definite may be expected from a national conference at this time. It is widely believed, however, that Mr. Lewis will leave no stone unturned to influence intervention on the part of the administration.

A mild intimation was given in official circles in Washington Saturday, March 11, that the government might invoke a court mandamus to compel the bituminous coal operators to confer on the wage agreement in advance of its expiration, March 31. It was said that, the 1920 wage agreement having been negotiated by a Presidential commission, it was regarded in the light of a government document subject to enforcement in the courts. While it was felt that the operators and miners in the various fields might get together it was intimated that if they should fail within a reasonable time before March 31, the government through a mandamus in a federal court might compel the operators to meet with the unions.

Union mine leaders have given out word to the effect that the miners as a body will not strike but will suspend work, so as to avoid the possibility of the government seeking an injunction against them, which procedure was taken in the 1919 strike.

Production and the Market

Weekly Review

AS THE date set for the suspension of mining approaches it is apparent that heavy reserves have been accumulated by railroads and the larger buyers. The volume of non-union offerings is increasing, consequently little uneasiness is being shown by the rank and file of steam consumers. Some open-shop mines are offering to make contracts on the basis of present price levels. The buyer shows very little interest in this, as so many considerations will enter into the matter this spring, but the availability of non-union tonnage is reassuring evidence to him that coal can be obtained when needed.

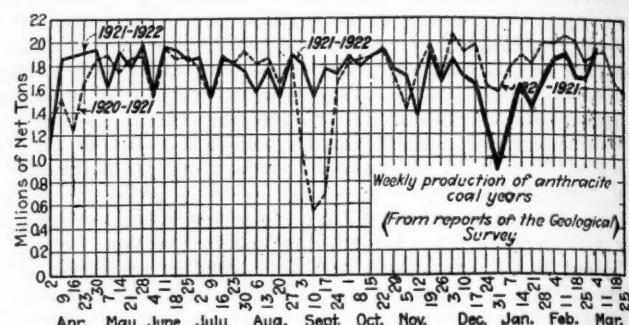
INTEREST IN MARKET ACTIVE; BUYERS CAUTIOUS

An active interest in the market is, of course, still being shown by coal users, but buying is proceeding so cautiously that the strike possibility has lost much of its influence as a market factor. Those who desired reserves as a protection have succeeded in putting aside what coal they want. This precludes any strength to spot prices and where quotations have been boosted the order generally falls through, for there is plenty of coal to be had and competition is too keen to sustain any upward price trend. *Coal Age* Index of current prices stands at 178 on March 13, as compared with 179 on March 6.

The saturation point is fast being approached, on the basis of present industrial requirements. Real encouragement is felt, however, in the slow but steady improvement in consumptive needs. Iron, steel and allied trades form the backbone of our industrial structure and their larger operations give promise of heavier coal orders. The recent strength in agricultural markets indicates better purchasing power on the part of farmers and presages more stocking activity in domestic coal this summer.

Anthracite producers are running on a close margin of domestic orders. The household consumers' stocking

program does not extend beyond actual needs for the balance of the season because of the hope of lower delivered costs on next winter's coal. Only a few retailers are preparing for heavy yard supplies, the majority now seeking to cover needs to May 1 only. Steam coals



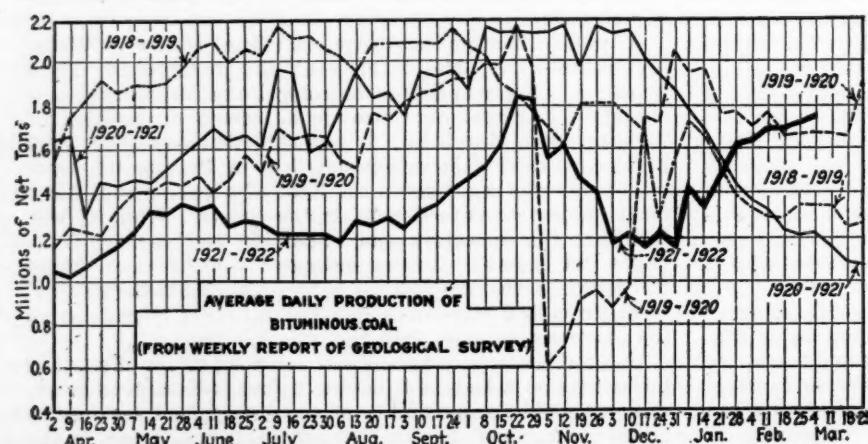
are not so active, as consumers' bins have been well filled lately. There are heavy stocks of buckwheat No. 1 at the mines.

The spot coke market has easily held its own. Production is still curtailed, although demand has improved. In the Connellsville region inquiries on second-quarter contracts have appeared and quotations on this business are stronger.

BITUMINOUS

The upward trend of production continued during the week ended March 4. The output reached 10,536,000 net tons, 162,000 tons in excess of the figure for the preceding week, but still some 2,600,000 tons short of the peak reached just before the mine strike of 1919 and 500,000 tons less than last October, when a railroad strike threatened to tie up transportation. Loading records for the early part of last week indicated a further increase in production.

The output has gained steadily since the first of the year. With the exception of the boom years 1916-1918, February production of 40,951,000 tons was greater than in any year before or since. This favorable showing is,



Estimates of Production

(Net Tons)

BITUMINOUS

Week ended:	1921-1922	1920-1921
Feb. 18 (b)	10,285,000	7,489,000
Feb. 25 (b)	10,374,000	7,432,000
March 4 (a)	10,536,000	7,278,000
Daily average.....	1,756,000	1,213,000
Coal year.....	391,945,000	496,639,000
Daily av. coal yr.....	1,382,000	1,745,000

ANTHRACITE

Feb. 25	1,701,000	1,816,000
March 4 (a)	1,913,000	1,902,000
Coal year.....	79,587,000	83,676,000

COKE

Feb. 25 (b)	1922	1921
146,000	193,000	
144,000	178,000	
1,131,000	2,095,000	

(a) Subject to revision. (b) Revised from last report.

of course, due principally to strike safeguards taken by consumers. It is estimated that another 10,000,000 tons of coal would be required to raise stock piles to the level reached at the close of the war.

February Tidewater dumpings increased 300,000 tons, as compared with the January figure. New England accounted for nearly one-half of the increase, although bunkers and exports also gained.

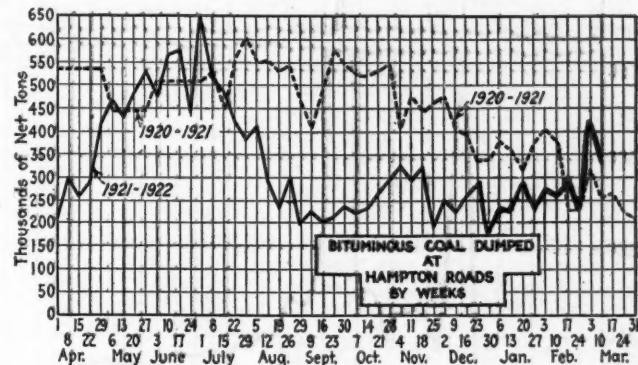
TIDEWATER BITUMINOUS COAL SHIPMENTS FOR THE MONTH OF FEBRUARY, 1922
(In thousands of net tons)

Destination	New York	Philadelphia	Baltimore	Hampton Roads	Charles-ton	Total Feb.	Total Jan.
Coastwise to New England	89	21	67	840	14	1,017	879
Exports	27	12	138	14	191	141	
Bunker	251	31	176	3	492	456	
Inside capes	180	94	18	..	292	270	
Other tonnage	574	1	3	55	..	633	579
Feb. Total	914	260	207	1,227	17	2,625	2,325
Jan. Total	798	246	217	1,049	15	..	

Hampton Roads dumpings were 346,553 net tons during the week ended March 9, as compared with 416,363 tons in the previous week. The coastwise movement to New England has been heavy, as shippers are pushing their coal in that section. New England markets, however, are nearly saturated, as shown by the increasing difficulty found in making sales, despite the fact that prices have been

lowered. Coastwise freights show a softening tendency, as bottoms are in oversupply.

All-rail shipments to New England declined to 3,868 cars during the week ended March 4, from 4,151 in the preceding week. The Southern coals dominate at all competi-



tive points in this territory and central Pennsylvania producers must provide for lower costs to regain their footing in these markets.

Chicago and Middle Western markets are draggy and the stocking program has about spent its force. In the

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Market	Feb. 13	Feb. 27	Mar. 6	Mar. 13	Market	Feb. 13	Feb. 27	Mar. 6	Mar. 13	
Quoted	1922	1922	1922	1922†	Quoted	1922	1922	1922	1922†	
Low-Volatile, Eastern					Market	Feb. 13	Feb. 27	Mar. 6	Mar. 13	
Pocahontas lump	Columbus...	\$3.35	\$3.25	\$3.20	\$3.00@ \$3.55	Columbus...	1.35	1.50	1.45	\$1.40@ \$1.60
Pocahontas mine run	Columbus...	1.90	2.15	1.85	1.75@ 2.00	Pitts. No. 8 lump	3.10	3.10	3.10	3.00@ 3.10
Pocahontas screenings	Columbus...	1.40	1.40	1.35	1.35@ 1.50	Pitts. No. 8 mine run	1.95	2.00	1.85@ 1.90	
Pocahontas lump	Chicago...	3.15	3.15	3.15	3.00@ 3.25	Pitts. No. 8 screenings	1.65	1.80	1.80	1.75@ 1.80
Pocahontas mine run	Chicago...	2.25	2.15	2.00	1.75@ 2.00					
Pocahontas lump	Cincinnati...	3.15	3.15	3.15	3.00@ 3.25					
Pocahontas mine run	Cincinnati...	1.85	1.75	1.75	1.75@ 1.75					
Pocahontas screenings	Cincinnati...	1.15	1.15	1.15	1.00@ 1.25					
*Smokeless mine run	Boston...	4.80	4.60	4.65	4.50@ 4.70					
Clearfield mine run	Boston...	1.95	1.95	1.95	1.65@ 2.25					
Cambria mine run	Boston...	2.45	2.45	2.45	2.25@ 2.60					
Somerset mine run	Boston...	1.90	1.90	1.90	1.75@ 2.00					
Pool 1 (Navy Standard)	New York...	3.00	3.00	3.00	2.75@ 3.15					
Pool 1 (Navy Standard)	Philadelphia...	3.05	3.05	3.05	2.85@ 3.25					
Pool 9 (Super. Low Vol.)	Baltimore...	2.60	2.70	2.70	2.65					
Pool 9 (Super. Low Vol.)	New York...	2.45	2.40	2.50	2.80@ 2.65					
Pool 9 (Super. Low Vol.)	Philadelphia...	2.45	2.45	2.45	2.20@ 2.65					
Pool 9 (Super. Low Vol.)	Baltimore...	2.30	2.40	2.30	2.00@ 2.30					
Pool 10 (H. Gr. Low Vol.)	New York...	2.10	2.00	2.10	1.90@ 2.15					
Pool 10 (H. Gr. Low Vol.)	Philadelphia...	2.10	2.10	2.10	1.95@ 2.20					
Pool 10 (H. Gr. Low Vol.)	Baltimore...	2.05	2.10	2.15	2.10@ 2.15					
Pool 11 (Low Vol.)	New York...	1.75	1.75	1.75	1.60@ 1.85					
Pool 11 (Low Vol.)	Philadelphia...	1.75	1.75	1.75	1.65@ 1.85					
Pool 11 (Low Vol.)	Baltimore...	1.75	1.85	1.95	2.00@ 2.05					
High-Volatile, Eastern										
Pool 54-64 (Gas and St.)	New York...	1.50	1.50	1.60	1.50@ 1.65					
Pool 54-64 (Gas and St.)	Philadelphia...	1.50	1.50	1.50	1.40@ 1.60					
Pool 54-64 (Gas and St.)	Baltimore...	1.40	1.40	1.55	1.50@ 1.60					
Pittsburgh se'd. Gas	Pittsburgh...	2.65	2.65	2.70	2.60@ 2.75					
Pittsburgh mine run (St.)	Pittsburgh...	2.15	2.15	2.15	2.10@ 2.20					
Pittsburgh slack (Gas)	Pittsburgh...	1.65	1.65	1.65	1.60@ 1.70					
Kanawha lump	Columbus...	2.65	2.55	2.50	2.25@ 2.75					
Kanawha mine run	Columbus...	1.65	1.60	1.60	1.50@ 1.75					
Kanawha screenings	Columbus...	1.35	1.40	1.30	1.30@ 1.45					
W. Va. Splint lump	Cincinnati...	2.65	2.25	2.25	2.25@ 2.75					
W. Va. Gas lump	Cincinnati...	2.00	1.85	2.00	2.00@ 2.25					
W. Va. mine run	Cincinnati...	1.60	1.40	1.35	1.35@ 1.40					
W. Va. screenings	Cincinnati...	1.30	1.30	1.30	1.25@ 1.35					
Hocking lump	Columbus...	2.75	2.55	2.65	2.50@ 2.70					
Hocking mine run	Columbus...	1.90	1.90	1.90	1.75@ 2.00					
South and Southwest										
Big Seam lump	Birmingham...	2.90	2.60	2.60	2.50@ 2.75					
Big Seam mine run	Birmingham...	1.85	1.85	1.85	1.70@ 2.00					
Big Seam (washed)	Birmingham...	2.10	1.85	1.85	1.75@ 2.00					
S. E. Ky. lump	Louisville...	2.75	2.55	2.45	2.25@ 2.60					
S. E. Ky. mine run	Louisville...	1.65	1.55	1.55	1.40@ 1.65					
S. E. Ky. screenings	Louisville...	1.15	1.35	1.30	1.25@ 1.40					
S. E. Ky. lump	Cincinnati...	2.65	2.35	2.25	2.25@ 2.75					
S. E. Ky. mine run	Cincinnati...	1.65	1.75	1.40	1.30@ 1.40					
S. E. Ky. screenings	Cincinnati...	1.05	1.15	1.20	1.25@ 1.35					
Kansas lump	Kansas City...	5.00	5.00	5.00	5.00					
Kansas mine run	Kansas City...	4.00	4.00	4.00	4.00					
Kansas screenings	Kansas City...	2.50	2.50	2.50	2.50					

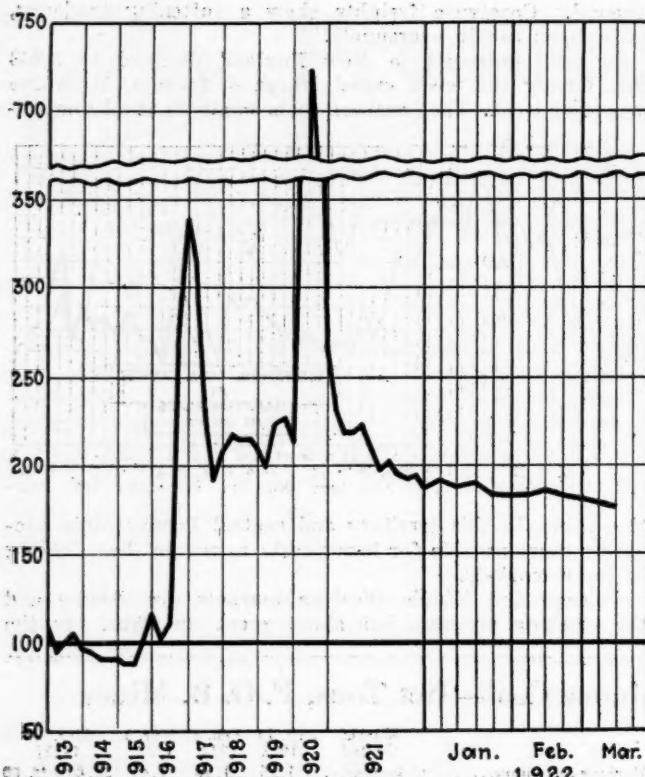
*Gross tons, f.o.b. vessel, Hampton Roads.

†Advances over previous week shown in heavy type, declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F. O. B. Mines

Market	Freight	Feb. 27, 1922	March 6, 1922	March 13, 1922
Quoted	Rates	Independent	Company	Independent
Brook...	New York...	\$2.61	\$7.60@ \$7.75	\$7.60@ \$7.75
Brook...	Philadelphia...	2.66	\$7.00@ \$7.50	7.75@ 7.85
Egg...	New York...	2.61	7.25@ 7.75	7.60@ 7.75
Egg...	Philadelphia...	2.66	7.15@ 7.75	7.15@ 7.75
Egg...	Chicago...	5.63	7.50*	7.50*
Stove...	New York...	2.61	7.75@ 8.10	7.75@ 8.10
Stove...	Philadelphia...	2.66	7.75@ 8.15	7.75@ 8.15
Stove...	Chicago...	5.63	7.75*	7.75*
Chestnut...	New York...	2.61	7.85@ 8.10	7.90@ 8.10
Chestnut...	Philadelphia...	2.66	7.75@ 8.15	7.75@ 8.15
Chestnut...	Chicago...	5.63	7.75*	7.75*
Pea...	New York...	2.47	5.00@ 5.25	5.75@ 6.45
Pea...	Philadelphia...	2.38	4.75@ 5.00	4.75@ 5.00
Pea...	Chicago...	5.63	6.10*	6.00*
Buckwheat No. 1...	New York...	2.47	3.00@ 3.50	3.50
Buckwheat No. 1...	Philadelphia...	2.38	2.75@ 3.50	3.50
Rice...	New York...	2.47	2.00@ 2.50	2.00@ 2.60
Rice...	Philadelphia...	2.38	2.00@ 2.50	2.00@ 2.50
Barley...	New York...	2.47	1.50@ 1.75	1.40@ 1.60
Barley...	Philadelphia...	2.38	1.50@ 1.75	1.50@ 1.75
Bindseye...	New York...	2.47	1.60@ 1.90	2.00@ 2.50

*Net tons, f.o.b. mines. †Advances over previous week shown in heavy type, declines in italics.



Coal Age Index 178, Week of March 13, 1922. Average spot price for same period, \$2.16. This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the total output of the United States, weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The result is a series of index numbers, plotted in the above diagram.

Northwest a belated buying movement has started, as some consumers fear that a prolonged tie-up would deplete dock stocks. Eastern Inland and Cincinnati Gateway points show less buying activity. Stocks have increased materially of late and the heavy volume of non-union receipts is reassuring those who are not in position to further safeguard their fuel supplies. Throughout the country the most active buyers at present are the railroads and public utilities.

Foreign Market And Export News

Export Clearances, Week Ended March 9, 1922

FROM HAMPTON ROADS:

For Atlantic Islands:	Tons
Nor. S.S. Godosund, for Curacao.....	1,716
For Brazil:	
Ital. S.S. Armando, for Buenos Aires.....	6,336
Br. S.S. Tapajoz, for Para.....	4,998
For Chile:	
Am. S.S. Orcus, for Valparaiso.....	4,618
For Cuba:	
Br. S.S. Berwindvale, for Havana.....	5,287
Am. S.S. Moldergaard, for San Juan..	215

FROM PHILADELPHIA:

For Nova Scotia, N. F.:	
Br. S.S. Vincent A. White, for Halifax....	

Coal Paragraphs from Foreign Lands

FRANCE—Production for the year 1921 is estimated at 28,240,887 metric tons. Mine consumption was over 4,000,000 tons; 961,000 tons were delivered to coke ovens, and 2,273,000 tons

converted into briquets. Production of lignite was 735,000 tons.

GERMANY—Production in the Ruhr region during the week ended Feb. 25 was 1,978,000 metric tons, according to a cable to *Coal Age*. The preceding week's output was 1,950,000 tons.

ITALY—Cardiff steam first is now quoted at 42s. 9d. on the Genoa market, according to a cable to *Coal Age*, an increase of 9d. in the past week.

SPAIN—The market in general is quiet. In the Leon and Palencia districts there is a lack of business, except in anthracite.

After a series of tentative measures Spain has at last established the new customs tariff. In glancing through the new tariff one is struck, among other things, by the sub-division of the items dealing with mineral combustibles.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report

Non-Union	Six Months July to Dec.	Jan. 1, to Feb. 25, 1922	Week Ended Feb. 25
	1921	Inclusive	Feb. 25
Alabama.....	63.5	60.5	62.0
Somerset.....	55.5	74.0	83.7
Panhandle, W. Va.....	55.3	46.7	52.2
Westmoreland.....	54.9	56.6	65.4
Virginia.....	54.8	55.8	70.7
Harlan.....	53.3	54.5	57.8
Hazard.....	51.7	61.3	62.7
Pocahontas.....	49.8	58.7	67.2
Tug River.....	48.1	60.5	73.8
Logan.....	47.6	58.5	68.3
Cumberland-Piedmont.....	46.6	48.1	53.3
Winding Gulf.....	45.7	61.2	66.3
Kenova-Thacker.....	38.2	51.1	61.6
N. E. Kentucky.....	32.9	42.8	49.5
New River**.....	24.3	29.0	36.9
Union			
Oklahoma.....	63.9	58.7	60.7
Iowa.....	57.4	75.6	81.2
Ohio, eastern.....	52.6	44.4	48.4
Missouri.....	50.7	61.8	61.0
Illinois.....	44.8	51.3	56.1
Kansas.....	42.0	49.2	56.4
Indiana.....	41.4	51.0	65.1
Pittsburgh f.	41.2	36.7	41.0
Central Pennsylvania.....	39.1	47.6	55.5
Fairmont.....	35.3	48.5	36.9
Western Kentucky.....	32.5	34.3	38.1
Pittsburgh *.....	30.4	27.7	31.1
Kanawha.....	26.0	13.8	19.8
Ohio, southern.....	22.9	23.9	27.8

*Rail and river mines combined.

†Rail mines.

**Union in 1921, non-union in 1922.

ANTHRACITE

Production of hard coal rose to 1,913,000 net tons during the week ended March 4, according to the Geological Survey. This was 212,000 tons in excess of the preceding week's output and slightly larger than the corresponding week of 1921. Only a few dealers are protecting their supplies further than May 1. Domestic consumers are buying just enough to last through the season and small orders constitute the bulk of the retail business. Steam coals are less active and it is evident that the recent heavy movement has nearly filled consumers' bins. Buckwheat No. 1 is fast approaching a sluggish position.

COKE

Beehive coke production was 144,000 net tons during the week ended March 4, only 2,000 tons less than in the previous week. Production in the Connellsville section has risen, while the demand is somewhat stronger. Spot prices have held firm and inquiries for second-quarter contracts have appeared. A moderate sized second-quarter contract for furnace coke was closed last week at \$3.50.

Formerly the items were: coal, coke and briquets; now they are sub-divided into anthracite, coal, other mineral combustibles, coke, briquets and retort carbon. Coal and anthracite pay 22.50 and 7.50 pesetas per ton; coke and briquets 27 and 9 pesetas and retort carbon 60 and 20. There is a bounty of 5 pesetas per ton on Spanish coal, equivalent to a similar increase in the tariff so far as imports are concerned.

BELGIUM—The coal market is pursuing the tendency toward a decline in prices. Milder weather has slowed down domestic sales and transactions in industrials lack importance on account of the growing imports of English coal.

Hampton Roads Pier Situation

	Week Ended March 2	March 9
N. & W. Piers, Lamberts Point:		
Cars on hand.....	2,156	2,533
Tons on hand.....	126,651	134,436
Tons dumped.....	160,268	122,795
Tonnage waiting.....	12,000	6,750
Virginian Ry. Piers, Sewall's Point:		
Cars on hand.....	1,585	1,424
Tons on hand.....	79,250	71,200
Tons dumped.....	128,043	125,909
Tonnage waiting.....	28,200	2,500
C. & O. Piers, Newport News:		
Cars on hand.....	1,273	1,373
Tons on hand.....	63,730	58,760
Tons dumped.....	83,442	60,719
Tonnage waiting.....	445	.....

British Output Highest Since Last December; Price Cuts Made on Prompt Business

BRITISH production during the week ended Feb. 25 reached the highest point since last December, according to a cable to *Coal Age*. The output reached 5,047,000 gross, as compared with 5,001,000 tons in the previous week. The export demand, while still active, has lost some of its insistence and concessions are being made to secure prompt business.

Increased prosperity is reported from the majority of coal centers, especially Northumberland and Durham. Prices have been steady, especially in steam and gas coals. The Bergen gasworks has ordered 20,000 tons of mixed Durham coals for delivery from April until August. Coking coal markets are also looking up.

As far as the Scottish markets are concerned, the ice-bound condition of the Baltic and Northern European ports has had a serious effect on shipments. The loss has fallen chiefly on the Forth and Fife ports. On the other hand, Continental buyers are indicating a tendency to negotiate forward engagements; and Scandinavia, France and Italy are showing an increasing interest in Scottish coals. The inactivity of the Scottish industries is holding back the inland trade.

There is more trouble in Wales. Men at some of the collieries in the neighborhood of Newport complain that whereas they are entitled to a minimum weekly wage of £2 14s. they have only been receiving sums varying from 15s. to 20s. As a result, men stormed the offices of some of the executives, there was some violence, and the officials were compelled to undertake that the minimum wages would be paid immediately.

The third section of the report of the Inspector of Mines for 1920, now published, gives a general review of the conditions prevailing in the British mining industry during the years 1913 to 1920.

The number of employees at mines and quarries increased from 1,236,211 in 1913 to 1,337,297 in 1920, or by 8 per cent. The selling value in 1920 of coal was greater by 241 per cent than the figure for 1913.

The total coal raised in 1920 was 229,532,081 gross tons. Except for 1918 this was the lowest recorded since 1903, and 25 per cent lower than the figure for 1913.

The amount of coal available for home consumption in 1920, neglecting the stocks held at the beginning and

at the end of the year, was 185,800,000 tons. Owing chiefly to the curtailment of shipments abroad, this quantity was only 3,300,000 tons less than in 1913.

January Exports Are Insignificant

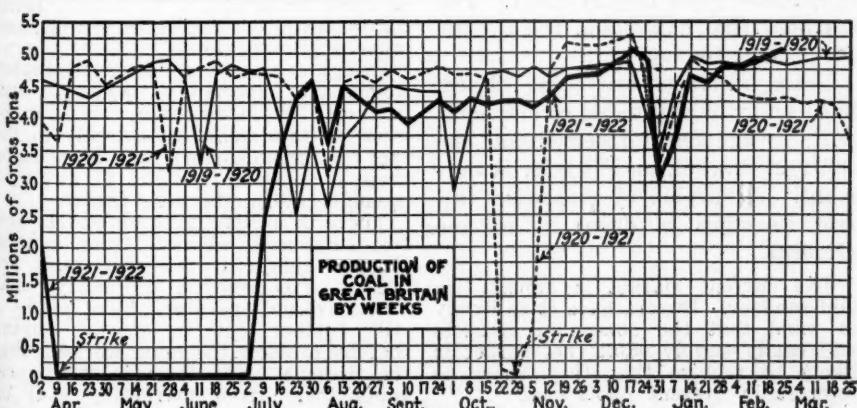
Exports of bituminous coal from the United States were 643,913 gross tons, as compared with 770,092 tons in December and 2,248,448 in January, 1921. Only about 100,000 tons went to destinations other than Canada and Mexico, showing to what extent our overseas exports have dropped. Imports of bituminous coal increased to 111,037 gross tons from the December tonnage of 87,506.

JANUARY EXPORTS AND IMPORTS (Gross Tons)

	Jan. 1921	Jan. 1922
<i>Exports, bituminous coal:</i>		
By rail to		
Canada.....	1,177,874	526,016
Mexico.....	32,176	7,177
Total.....	1,210,050	533,193
By vessel to		
West Indies.....	34,065	12,623
Panama.....	51,452	9,625
Cuba.....	55,003	41,240
Total.....	140,520	63,488
Argentina.....	107,135	14,566
Brazil.....	35,651	12,365
Chile.....	66,277	680
Uruguay.....	11,065	.....
Total South America.....	220,128	27,611
France.....	143,448	.....
Italy.....	185,907	8,206
Netherlands.....	76,538	.....
Sweden.....	17,707	.....
Denmark.....	30,165	.....
Norway.....	29,246	.....
Total Europe.....	483,011	8,206
Egypt.....	78,637	7,199
Other Countries.....	116,102	4,216
Total bituminous.....	2,248,448	643,913
Total anthracite.....	289,340	224,040
Total coke.....	36,745	30,372
<i>Imports, Bituminous Coal:</i>		
Imported from:		
United Kingdom.....	1,500	17,025
Canada.....	64,834	82,263
Japan.....	.....	2,075
Australia.....	.....	9,674
Other countries.....	525	.....
Total.....	66,859	111,037

Hampton Roads Shippers Cultivating South American Markets

Coal dumpings fell off slightly last week, although the market was still brisk, with a tone of optimism over all. The Virginian Piers lead in dumpings for the first time in many months, and all piers show prospects of breaking the high record made in February.



While the demand was active, prices were weak, the best bunker coal being available in unlimited quantities for \$4.75, and other grades ranging down as far as \$4.25. Continued activity in the mines serving this territory was seen.

Coastwise trade leads, with demand for bunkers strong and with export movements holding their own. Coal to the West Indies is still in demand, with prospects for movement of larger quantities to South America soon.

Agitation on the part of certain Northern ports for uniformity in freight rates, to affect bunker coal, was received with much concern by Hampton Roads shippers. They are preparing to fight any such adjustment which would be calculated to deprive this port of its geographical advantages.

French Coal Imports in December, 1921

	Tons
Coal from England	1,177,215
Belgium	179,321
United States	6,258
Germany	439,614
Sarre	1,354,489
Other countries	29,093
Total	3,185,990
 Coke from	
Belgium	12,092
England	11
Germany	220,661
Other countries	51,776
Total	284,540
 Briquets from	
England	19,871
Belgium	63,315
Germany	61,226
Other countries	26,501
Total	170,913
 Total, all fuels	3,641,443
Total, November	3,914,006

Pier and Bunker Prices, Gross Tons

	PIERS	
	March 4	March 11†
Pool 9, New York.....	\$5.40@ \$5.60	\$5.50@ \$5.75
Pool 10, New York.....	5.10@ 5.20	5.20@ 5.40
Pool 9, Philadelphia.....	5.50@ 5.85	5.50@ 5.85
Pool 10, Philadelphia.....	5.20@ 5.60	5.20@ 5.60
Pool 71, Philadelphia.....	5.70@ 6.00	5.70@ 6.00
Pool 1, Hamp. Rds.....	4.60	4.60
Pools 5-6 Hamp. Rds.....	4.25	4.15@ 4.25
Pool 2, Hamp. Rds.....	4.45	4.45
 BUNKERS		
Pool 9, New York.....	\$5.70@ \$5.90	\$5.90@ \$6.15
Pool 10, New York.....	5.40@ 5.50	5.50@ 5.70
Pool 9, Philadelphia.....	5.90@ 6.10	5.90@ 6.10
Pool 10, Philadelphia.....	5.60@ 5.85	5.60@ 5.85
Pool 1, Hamp. Rds.....	4.75	4.75
Pool 2, Hamp. Rds.....	4.55	4.55
Welsh, Gibraltar.....	38s. f.o.b.	38s. f.o.b.
Welsh, Rio de Janeiro.....	55s. f.o.b.	55s. f.o.b.
Welsh, Lisbon.....	40s. f.o.b.	40s. f.o.b.
Welsh, La Plata.....	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa.....	39s. t.i.b.	39s. t.i.b.
Welsh, Messina.....	36s. t.i.b.	36s. t.i.b.
Welsh, Algiers.....	34s. f.o.b.	34s. f.o.b.
Welsh, Pernambuco.....	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Bahia.....	62s. 6d. f.o.b.	62s. 6d. f.o.b.
Welsh, Madeira.....	40s. f.a.s.	40s. f.a.s.
Welsh, Teneriffe.....	40s. f.a.s.	40s. f.a.s.
Welsh, Malta.....	40s. f.o.b.	40s. f.o.b.
Welsh, Las Palmas.....	40s. f.a.s.	40s. f.a.s.
Welsh, Naples.....	39s. f.o.b.	39s. f.o.b.
Welsh, Rosario.....	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore.....	55s. f.o.b.	55s. f.o.b.
Port Said.....	40s. 6d. f.o.b.	40s. 6d. f.o.b.
Belgian, Antwerp.....	30s.	30s.
Alexandria.....	47s.	45s.
Bombay.....	38 rupees	38 rupees
Capetown.....	42s.	39s.

Current Quotations British Coal f.o.b. Port, Gross Tons

	Foreign Quotations by Cable to Coal Age	
Cardiff.....	March 4	March 11†
Admiralty, Large.....	27s. @ 27s. 6d.	27s. @ 27s. 6d.
Steam, Smalls.....	19s. 6d. @ 20s.	19s. 6d. @ 20s.
Newcastle:		
Best Steams.....	25s.	25s.
Best Gas.....	23s. @ 24s.	24s.
Best Bunkers.....	23s. 6d. @ 24s.	23s. @ 24s.

†Advances over previous week, shown in heavy type; declines in italics.

North Atlantic

Spot Market Weakens As Stock Piles Grow

With Stocks Good and Heavy Non-Union Offerings, Market Lacks Snap—Railroad Buying Is Market Feature—Not Much Contract Interest Shown Before Strike.

Little nervousness is being shown over a shortage resulting from a strike. There is so much non-union tonnage available and stocks are so good at the present rate of consumption that there is no snap to the market. Railroad buying is the best market feature at this time.

Prices show a softening tendency, although receipts at the larger centers are being cut to lower levels than have prevailed recently. Non-union coals are being freely offered on every hand and in some instances producers are seeking contracts, using the present market as a price basis. Not much contract interest is being shown, however, buyers preferring to await the new conditions after the strike settlement.

NEW YORK

Large consumers have some coal in reserve, and, with the non-union mines producing after April 1, there is a strong feeling that the strike discomfort will be slight. Railroads and public service corporations are well supplied.

There were about 1,700 cars of coal at the local docks on March 10, a lower number than for many days and a decrease of about 500 cars over the corresponding day of the previous week. Contracting is hardly discussed. Both coal man and consumer are awaiting the outcome of the wage negotiations before deciding upon the course to be taken.

Local dealers will watch with interest today the prices submitted at the opening of bids for coal for ten city departments, the contracts to run for three months.

PHILADELPHIA

Buyers still remain indifferent to the possibilities of a strike. The larger consumer has in many instances fortified himself with a surplus of from 30 to 90 days, and the other class of consumers feels certain that there will be enough coal mined to prevent any distress. There probably has not been a time since the present depression started that so much non-union coal has been offered here.

The iron industry continues stagnant. It would seem that the independent plants in this territory did not recover from the depression with the same degree as the corporation plants in the other sections of the country.

The consumer is also growing somewhat dubious now of an early reduction

in freight rates. Those cheerful spirits who have looked for a cut by April 1 are now pointing to July 1 as the objective point, but even this seems to be doubtful.

FAIRMONT

Taking northern West Virginia as a whole the market is soft. Buyers seem indifferent as to whether they are able to secure supplies or not before April 1. Although railroads are securing the bulk of the tonnage produced, comparatively few are taking on more fuel. A few carriers, however, are placing contracts.

BALTIMORE

Local demand has lightened rather than increased in the face of the near approach of the strike period. Prices have likewise slipped so that at times Pool 9 is offering as low as \$2.15 a net ton f.o.b. mines, although the average range is some 15c. or so higher. Excellent gas coals are on the market around \$2.35 per net ton mine basis.

The export movement from Baltimore continues exceptionally poor, not a single ship having cleared from the

New England

Market Quiet; Shave Price At Times to Make Sales

Shippers Exert Every Resource—Unsold Cargoes Numerous — Textile Strike Closes Important Outlet to Large Purchases—Drop in Marine Freights Presaged.

New England markets are very quiet. Shippers are constantly exerting pressure to move coal and prices are shaved if necessary to make the sale. Unsold cargoes are numerous. Steam supplies are so heavy that only spasmodic purchases are possible until industrial conditions show some improvement. The textile strike has closed the avenue for a large tonnage.

Some contracts are being closed, but usually only with old connections, with a wage clause inserted, and the contract market, as a whole, is dormant. A surplus of coastwise vessels presages a drop in marine freights.

The current market is almost like mid-summer. Buyers have it so firmly in mind that the non-union districts will easily supply what the market is likely to require that they show no interest in present quotations.

There are cargoes waiting to dis-

port from Feb. 10 to the end of the month, and the total movement of 12,584 tons being a low record for the port in coal cargo movement.

CENTRAL PENNSYLVANIA

Under instructions from the national organization, the miners of this district took a referendum on the question of a suspension on April 1. As this vote will not be counted until after March 15, the result will not be known much in advance of the day set to suspend.

In view of the policy adopted at the Indianapolis convention, operators cannot see that any practical results will follow a joint conference. It is contended that the miners will file their demand, based upon the action at the convention, plus such demands as may be made in District No. 2, while the operators could only file a counter proposition, based upon a comparison of conditions here and in the non-union fields.

Production is steadily increasing. During February, the field produced 3,864,709 tons, as compared with 3,373,734 tons in January.

UPPER POTOMAC

Conditions remain virtually unchanged. It is impossible to produce much coal, owing to the competition of non-union fields. A few plants are being added to the list of those which have scaled down wages to a point where production is possible. Pools 10 and 11 seem to be a little stiffer.

charge at Boston and Providence, the bulk of them unsold, and unless the factors handling them have more success the next few days we shall probably hear of very low prices to move distress coal.

Now that the demand here has slackened the outlet for smokeless coals at Hampton Roads is becoming narrow and restricted. A fair tonnage of prepared coal is moving West in view of the differential in its favor as compared with anthracite and in view also of the probable suspension of anthracite mining on April 1.

There is little to report with respect to contracts for next season. A few pieces of business have been closed in accustomed channels, but in such cases it is understood there is a provision for a sliding scale price which is to be fixed from month to month, being contingent on wages, railroad tolls, and other uncertain items.

Freights coastwise from Hampton Roads are expected to moderate still further. While no lower rates can be reported this week, due largely to the fact that few charters have been made, there is reason to predict \$1 flat as a possible rate in the near future.

There is so little area accessible now for shipments all-rail from central Pennsylvania that few quotations are heard. For reasons of policy some Pennsylvania operators have made a still further cut in prices, hoping thereby to show the mine workers that the present wage scale is what prevents them from marketing coal on any commercial basis.

Anthracite

Retail Stocking Stimulates Production of Anthracite

Present Costs Preclude Covering Beyond May 1, as Domestic Consumers Are Indifferent to Strike—Demand for Steam Coals Wanes.

Production of anthracite has been stimulated by a belated retail stocking movement. Comparatively few retailers, however, are seeking to cover for a longer period than May 1, as no one wants much of a carry-over tonnage, based on present costs. Domestic consumers are buying sparingly and display little interest in the coming strike. It is apparent that the minimum of requirements is all that will move into the householder's bin during the balance of this season.

Steam coals are not in such heavy demand, as storage customers have been well supplied in the last few weeks. Buckwheat No. 1 is the slowest and there are large supplies at the mines.

NEW YORK

Consumers are not taking the advice of tradesmen to fill their bins, or at least to put in enough coal to last them until May 1. The reverse is taking place in New England, according to reports coming to local houses.

The tendency among the largest retail dealers and those having yard space is to lay in sufficient coal to meet their requirements until May 1.

Egg coal, which has been comparatively easy, is slowly gaining strength. Pea remains stagnant, and while quotations are firm, it was said that buyers have been able in some instances to shade the quoted figures.

The market for steam coals is easier. Buckwheat No. 1 is slowing down. Rice coal is in better demand than buckwheat, and the upper-region coals are able to command slight premiums. Barley is still the strongest of the list.

Washery coals are being offered in some quarters here on a basis of \$6.15 for chestnut; \$4.40 for pea; \$2.90 for buckwheat; \$2.40 for rice, and \$1.65 for barley.

BUFFALO

Dealers are ordering as needed and a fair amount of trade is reported, though there is not much inquiry for beyond winter requirements. The strike talk is producing little effect, the general feeling among dealers being that coal will be cheaper and that it will pay to wait before adding largely to stocks.

Some inquiry is being made regarding the chartering of Lake vessels for the coming season, and it is expected that something will be done in this line soon. Last year was a heavy shipping

season in anthracite, and stocks are said to have been holding on a little longer than usual at the upper docks.

PHILADELPHIA

Dealers are laying by a moderate tonnage, most of them being content if they can get enough to carry them a month. There is also the occasional exception of a dealer who is letting stock run down to almost nothing. There is certain to be trouble in the anthracite region, and the people at the mines are in readiness for a period of idleness.

There has probably never been a time when so many "short orders" have been received, and these small orders are really the life of the retailer now. Many dealers are circularizing their customers, giving them the present status of the mining situation. Generally the advice is that, while future prices are bound to be lower, it is the part of wisdom for the consumer to have at least enough coal on hand to finish out the season prior to April 1.

Most of the companies are about booked up for the balance of the month on stove and nut, and some have enough egg to finish out. Pea is still extremely plentiful. As to retail prices, the threatened strike has had the effect of making for solidarity among the dealers.

Buckwheat is still inclined to lag. Barley still maintains its boom, and the production is quickly moved. It is believed that the concerns stocking buckwheat are fast reaching their limit.

ANTHRACITE FIELDS

Rainy weather has caused an inflow of water at many mines, and a few have been forced to close down part of their workings. A strike of steam shovel engineers, due to seniority rights, has been called in the Hazleton region, which has affected stripping operations.

Production fails to show much stimulation. However, were it not for the strike impetus conditions would be deplorable. If there is no suspension on April 1 we may look for exceedingly slack times during the spring and summer.

BOSTON

While there has been steady retailer buying there is at the same time no real snap to the business. In general this probably reflects the attitude of the public that domestic sizes are much too high and that the coming discussion of wages will result in a very material reduction. In any case, consumers are not being scared over the outlook and unless there is newspaper agitation in April it is quite possible there will be no very much increased demand while negotiations are in process.

Meanwhile, the weather is so spring-like that actual household needs are small and do not encourage the retail distributor to replace what little he is moving. There has been no change in retail price here since early in the

year and it is not likely there will be any modification until a spring basis is announced.

BALTIMORE

Dealers are not making any attempt to store much coal in preparation for the strike. They have felt that to purchase any considerable quantity of coal at the present schedule of prices, when a strike settlement might catch them with much fuel on hand gathered at a price higher than the then prevailing rates, would be unwise.

Much interest is taken here in a bill introduced in the legislature to have a uniform 2,000 pound ton in Maryland. The practice has been to sell soft coal on the net ton basis in most cases, while hard coal is sold to the public on the long ton basis. The ton prices of Baltimore would of course be adjusted to the new condition, and on the face would show a cut of \$1 or more. As usual, there will be opposition and charges that the coal men are trying to put one over, but it is hoped that common sense will prevail in the consideration of this important matter.

South

BIRMINGHAM

There is a little better spot demand than there was a week ago, and also some inquiry for contract business from utilities. Some few twelve-month agreements have been signed up, although the tonnage involved is not extensive. The principal encouraging feature is the presence of a better feeling in trade circles, though there is nothing as yet either in the way of actual bookings or indications that the industry has turned the corner definitely to create any great amount of optimism.

The railroads are taking a much heavier tonnage. The Mobile & Ohio has closed a fuel contract with mines on its lines in Tuscaloosa County for a twelve-month period for a tonnage reported to aggregate between 250,000 and 300,000 tons or its entire yearly requirements for its lines south of Okalona, Miss. This is the first time that coal for this system has been purchased in the Alabama field, having formerly been acquired from Illinois producers. Proposals covering the fuel needs of the Louisville & Nashville and the Frisco lines normally taken from this district are expected in the local market shortly.

Production has gradually climbed since the beginning of the year from 220,000 tons to 275,000 tons for the week of Feb. 25. From present indications production for the week of March 4 will be about the same as the previous week. Increased output is due in a large measure to a heavier movement of railroad fuel and additional blast furnaces put in operation.

VIRGINIA

Production gains at the outset of March brought the total output up to more than 70 per cent of potential capacity. Many mines heretofore in idleness were able to resume operations. The improvement was particularly noticeable in the Clinch Valley section. The increase is attributed to a heavier steam demand. This has stiffened prices to a slight extent.

Chicago and Midwest

Demand Slackens; Stocking Program Seems Near End

Buyers Other Than Railroads and Utilities Rely on Present Stocks and Non-Union Supply—Market Softening—Eastern Producers More Cautious in Consigning Tonnage Here.

Slackening demand is daily becoming more apparent. With the exception of railroads and utilities, consumers are taking less tonnage as a strike safeguard. This stocking program appears to be nearing its end, as the buyer feels that reserve supplies, augmented by non-union coal in the strike emergency, will be sufficient to tide over the mining suspension. Those consumers who have definite manufacturing plans are generally protected with a 60-day reserve supply of fuel, while others say they will not be embarrassed if forced to close down on account of a fuel shortage.

The softening condition of the market has checked the flow of non-union coal. Eastern producers are more cautious in their consignments to the Midwest, as considerable tonnage has been sold recently under forced conditions, to avoid demurrage. Production in Indiana has suffered most from the low-priced Eastern invasion. Illinois producers have been able to market their production with a minimum of "no bills."

At the end of the week there was nothing encouraging in the Midwest trade as viewed from Chicago. Sales managers who have persistently been optimistic through the past weeks could see nothing but uncertainty from now until next fall when everybody agrees the mines will be back at work and industrial demand will be better than it is at present, but still not greedy for coal. The movement of coal from Illinois, Indiana and the non-union Eastern fields into this region has been rather unsteady during the past few days but prices have not wobbled wildly. Only a few declines have been recorded in spite of the fact that on one or two days the badly spotted market nearly blanketed out demand entirely.

Eastern coals of the class that seldom appeared in the Midwest until this season, have not been flooding the region in spite of their price advantages over the Illinois and Indiana products. Doubtful demand has seen to that. No longer do companies start long trains of it toward Chicago, billed to themselves, confident that the market would be ready for it when it arrived. Buying has been so careful that last week's habit of purchasers insisting upon car numbers on everything they bought has continued. The trade has

grown so finicky, in fact, that one sales agency on Saturday even declared there was an epidemic of refusals abroad in the land. Other companies with headquarters in Chicago insisted they had seen nothing of that.

The general opinion is that stocking is practically finished and that nobody, unless it be the railroads, has any intention of winding up the month with a rush into the market. Most consumers are trusting to a short strike and to the much-heralded supply of non-union coal. Those manufacturers who are actually busy and expect to remain so through the summer are stocked for at least 60 days. Those who are doing little business are stocked not at all and will close up shop, if need be, without great pain.

Demand from centers in the West and Northwest served by Chicago is nearly as dead as it is in the city. Country demand would be down to nothing were it not for a very slight tendency displayed by some detailers to lay in small piles of stock.

Production in the Midwest has been fully as spotted as the market. Indiana, suffering most from the Eastern low-price invasion, has been hard hit and Illinois mines, as a whole, are a little below last week. Reports in the middle of the week showed less than 100 cars on track in Williamson and Saline countries, which is practically nothing.

CHICAGO

The Chicago market displayed no marked tendencies one way or the other during the past week except that at the end most coal men felt discouraged as they looked into the immediate future. There can be no doubt that consumers have been apathetic toward the strike and the dangers that may develop in it for them.

Stocks in the hands of public utilities and factories locally vary from 90 days down to next to nothing and most operators agree that stocking for the strike is completed. There remains for the rest of the month, then, little business to be had beyond caring for normal consumption, which naturally is low, and supplying retail dealers with a little extra stock.

Bituminous prepared sizes have been slow all week though there has been no change in prices. Quotations have ranged \$3.25@\$3.65 on this class of coal from southern Illinois over a period of several days, though central Illinois prepared sizes have notched downward about 25c. to a level Saturday of \$2.65@\$3. Screenings continue unpopular with hardly any from the southern Illinois fields selling for more than \$1.75 at the end of the week and with central Illinois quotations ranging \$1.50@\$1.85. Belleville screenings showed a slight downward trend to \$1.10@\$1.35 which represented a slump of approximately 15c. Indiana coals held firm.

Pocahontas and New River shipments to this market have been moderate during the week. Prices have gone down a hair's breadth on prepared sizes to \$3@\$3.25.

There is nothing interesting in anthracite. Most consumers appear to have on hand enough to finish out the winter. Balmy weather most of the week has roused no demand worth noting.

LOUISVILLE

Demand is duller all along the line and prices are weaker. There is some demurrage steam coal on the market, but it is being cleaned up fast. Some very good lump is quoted \$2@\$2.25 from eastern Kentucky, but mine run is firm at \$1.25@\$1.65. Harlan districts are paying the 1917 scale, while Hazard has cut under that level.

Block will probably be hard to move from now on, which will result in stiffer prices perhaps for steam coals. Prices today are closer together than for a long time, the cheapest screenings being around \$1.10, while some lump is quoted as high as \$2.60@\$2.75 a ton. However, it is hard to sell lump at over \$2.25.

ST. LOUIS

Domestic buying is unusually slow. Orders are for the cheaper grades and in smaller quantities. The statement in a daily paper that there would be no shortage of Illinois coal but that if there were there would be a sufficient supply of non-union coal to fall back on had the effect of stopping all prospective storage of coal for the local plants and has changed the general tone of the market.

The manufacturer is not figuring on any coal shortage and judging from the way the householder is buying spring ought to be here the first day of April and summer a few days after.

Country buying is light, especially on steam. Very little is moving. Country domestic business has picked up a little on account of the colder weather.

SOUTHERN ILLINOIS

A falling off in everything except screenings was noticeable last week. Dealers do not seem to be getting much coal other than for current needs. Railroads are still buying heavily, but it is understood that they are going to bank on the last week's supply, which will be held in cars.

Cars are plentiful, although movement on some roads is a little bit slow, especially the Burlington and the Missouri Pacific.

There is considerable dissatisfaction on account of the poor working time which has caused the miner to decide that he must not take a reduction in the scale when he cannot live on the present wage with the work offered.

Throughout Franklin County in many mining communities there is absolute distress and hunger in the families of miners who have been out of work for several months. This is getting so pronounced that the municipalities are taking steps toward helping.

Duquoin and Jackson field conditions are somewhat similar to those in Carterville. Some mines have been idle for many months and a few operations are shortly to be sold under the hammer. In the Mt. Olive district a little better working time is noticeable the past week on account of storage coal for Chicago and a little movement to Omaha and Kansas City. Prices, however, are not strong.

The Standard district plugs along without anything of particular interest. Some mines get as much as four days a week. Others, however, have been idle for a year. Prices are at cost of production or below. A little mine run is being loaded for railroads but this is not general. The railroads do not seem to be buying as heavy in this district as they usually do at this time.

WESTERN KENTUCKY

Movement of coal is slower and prices weaker. Some contract customers are well stocked, and many large industries which have been buying screenings freely are holding up shipments due to large stocks on hand.

It is believed that within a few days lump demand will again be very slow, with screenings scarce and stiffer in price. A decisive statement relative to the strike would probably start mine run moving much better, but just now the market as a whole is very dull.

Mines are operating part time with plenty of cars and no shortage of labor. However, until the strike looks more serious it will be no easy matter to interest buyers.

Coke

BUFFALO

Foundry coke is scarce and some producers are not quoting, while others have been making higher prices. The coke market generally is stronger and delays are encountered of as much as two weeks on the shipment of some sizes.

Prices are \$4.50@\$4.75 for 72-hr. Connellsville foundry, \$3.50@\$3.75 for 48-hr. furnace and \$3 for the smaller sizes, with \$3.64 added for freight.

UNIONTOWN

There have been no market developments during the past week, other than a slipping back to the old stage of no buyers. Following the sudden flurry in the coke market of two weeks ago, furnace, while not soft, does not have much demand and production for open market delivery is being made only in a limited tonnage.

The same difficulty is experienced in selling coal. The only demand found here is for carload lots. Sewickley steam is quoted \$1.30@\$1.45 with Pittsburgh steam at \$1.50@\$1.65 and by-product, \$1.65@\$1.75.

CONNELLSVILLE

The spot coke market has easily held its own in the past week, while inquiry against second-quarter contracts has been more active.

There is a slight trend in the direction of blast furnaces going in. A moderate sized second-quarter contract has been closed at \$3.50, for a high grade of coke, this comparing with a recent contract at \$3.25. A Buffalo interest, operating byproduct ovens with its own union-mined coal, inquired first for Connellsville coal to take care of its requirements after April 1, and on being quoted \$2.25 or thereabouts issued an inquiry for coke, which is now pending, prices of \$3.50@\$3.75 having been quoted.

Many comparisons are being made in the trade as to the relative profitability of coal and coke sales at the present time, but as there is a wider quality range in coal prices than in coke prices the comparisons are not very illuminating as to actual conditions.

The coke market is quotable at

\$3.25@\$3.50 for spot and contract furnace and \$4.25@\$4.75 for spot and prompt foundry.

The *Courier* reports production during the week ended March 4 at 69,020 tons by the furnace ovens, and 43,690 tons by the merchant ovens, a total of 112,710 tons, an increase of 6,980 tons.

Northwest

Coal Traffic Increases; Price Market Is Firmer

**Fear of Prolonged Mining Suspension
Creates Disposition to Lay in
Reserves — Uncertainty in Many
Quarters — Some Procrastinate —
Others Play Safe.**

Northwestern markets are quiet, but small lots are moving readily. Docks have enough orders in hand for ten days steady operation. Some fear that dock stocks may be depleted by a prolonged mining suspension has caused more of a disposition to buy reserve tonnage during the past week. However, much uncertainty prevails as to the proper course to pursue. Many prefer to postpone buying until the last moment, while others are playing safe and taking in more coal than they need for immediate requirements. The aggregate result is a firmer price market, with traffic showing an increase. Industrial conditions are improving, but very slowly.

MINNEAPOLIS

The trade continues to be in a most perplexed state of mind over the policy to pursue with reference to buying for demands after the first of April. It is known that there is an ample supply of coal, both soft and hard, for a considerable length of time, two or three months or more. If it could be assured that the difficulties attending the wage settlement could be adjusted and work resumed in time to supply the Northwest for next winter, the answer would be plain.

There is no danger of the Northwest being short of fuel of any kind for the next three months. But if the stocks on the docks are absorbed and the late summer and fall do not send forward enough coal for the winter of 1922-23, then there will be trouble. But those who lay in their supplies from present stores may be able to meet their early fall demands, while others less provident are without coal.

It is regarded as reasonably sure that the outcome of any strike will result in lower production costs. Hence those who buy on present costs may have high-priced coal on their hands while those who defer, may have cheaper coal to offer in competition.

Steam users are storing away a reasonable supply of fuel against the certain suspension which is set for April

1. Larger users like street car companies are putting in all that they can care for. But most of the lesser consumers are not inclined to give much heed to the threat of a fuel shortage.

The certainty of a shutdown has resulted in strengthening prices on soft coal. It is likely that there will be some other price changes, as the season draws on, and the strike becomes more assured. The sentiment in the coal trade here is that the operators ought to hold out for a complete revision of the arrangements which have been allowed in previous wage agreements, and to insist upon doing away with the grosser impositions.

DULUTH

Shipments from the docks aggregated 18,276 cars during February, according to official figures. This is less than the January shipments of 24,521 cars, but is much greater than during February last year, when but 7,450 cars went out. Duluth docks shipped 6,173 cars and Superior docks 12,103 cars. The decrease in shipments was due entirely to the week of heavy snow which the country suffered here.

As a result of the cold weather sufficient orders are on hand to carry the docks for a week or ten days to come. A shortage of cars which threatened to be serious last week has been cleared up.

Youghiogheny, Hocking and Splint have been advanced 50c. by retail dealers, in response to the advance from docks last month. Anthracite stands firm at levels before quoted. It seems probable that hard coal has seen its last advance for the season, but no lowering of rates is contemplated.

Some apprehension is felt that the threatened coal strike will not be settled before dock stocks are depleted. Following this line of reasoning, many large manufacturing plants are showing a disposition to place more orders.

MILWAUKEE

The market is quiet, but dealers report a steady demand for small lots. Buyers are only taking enough for immediate needs.

There is no disposition to shade prices, notwithstanding the approach of the Lake season, as stocks are being husbanded in anticipation of strike trouble. The docks hold enough coal to last 90 days or more, and the coke supply is sufficient to last until July.

The anthracite situation is the poorest, of course, but a strike, if it occurs, will find hard coal demand at the lowest ebb of the year. Receivers here say there is a large supply of soft coal on the docks near the mines, which will begin to come as soon as navigation opens.

Eastern Inland

Industrial Gains Hold Promise for Coal Trade

**Based on Recent Low Consumption,
Market Is Nearly Saturated—Strike
Needs Discounted by Non-Union
Activity — Prices Show Softening
Tendency.**

Coal stocks are fast approaching the point where they may be considered adequate for a long period, based on present low requirements. The strike needs are being greatly discounted as non-union operations are so active. It is felt that these coals, coupled with reserve piles now on hand, will fill all demands that may be made, even in the event of a prolonged strike. The result is that the market is nearly at the saturation point and prices show a softening tendency.

Real encouragement is felt, however, by the increasing industrial consumption. Iron, steel and allied manufacturers, which form the backbone of the industrial structure here, are operating on heavier schedules, thereby promising larger coal orders.

PITTSBURGH

The Pittsburgh Coal Producers' Association has issued a formal statement to the public, outlining in detail its position on labor matters, which the trade has clearly understood for two months and more past. The operators reiterate that they are willing to meet the men of the district to negotiate a wage scale without the check-off.

Miners have evinced no desire to enter into a district conference and it is generally assumed that the whole moral force of the national officials of the U. M. W. will be used to discourage them from doing so. There is more divergence of opinion than formerly as to the size and duration of the prospective suspension, as there are now a few observers who express the opinion that the suspension will not amount to much.

There is no material increase in the volume of coal mining but the common opinion is that the turnover has been running decidedly heavier for a couple of months than would be the case if no labor trouble were in prospect. Holders of contracts have also been taking heavier deliveries. Demand upon the non-union fields seems to have been slightly lighter in the past two or three weeks.

The market remains quotable approximately as follows: Steam slack, \$1.30@\$1.50; gas slack, \$1.60@\$1.70; steam mine run and ordinary gas, \$2.10@\$2.20; 1-in., \$2.60@\$2.75; Panhandle 1-in. domestic lump, \$2.75@\$2.90; high grade gas, mine run, \$2.75@\$3; 1-in., \$3.25@\$3.50.

BUFFALO

Business is on a less satisfactory scale than for months past. Very few inquiries are now being received. The strike talk fails to make any impression, and evidently the effect has been discounted by laying in of supplies during the past two months.

Action has been taken by the Buffalo Chamber of Commerce and other similar organizations to advise consumers to lay in a stock of coal to last for at least six weeks, but, as many have already done so, little new business has resulted. Coal men say their letters of warning along the same line have brought out few inquiries or orders.

The trend of prices has been downward, except in slack, which holds steady. Steam and gas slack, however, are not now selling as far apart as formerly. Prices are; \$2.60 for Youghiogheny gas lump, \$2.35 for Pittsburgh and No. 8 steam lump, \$2.10 for Allegheny Valley and other mine run and \$1.70@\$1.80 for slack.

CLEVELAND

Actual softness has crept into the situation in the last few days and prices seemed less steady than for some time. The only note of encouragement to be found is the evidence of growing consumption by industries. Even though slight, this development contains more real promise than any buying movement in anticipation of the strike could be.

There has been no increase in industrial storing. Lack of ready cash, expectations of lower prices, uncertainty over future needs, and some doubt that the strike will be so prolonged as to cause serious coal shortages, have combined to restrain buying. The industrial stock pile in and around Cleveland is sufficient to last for from 30 to 60 days, according to best estimates. Public utilities have enough fuel on hand to run for 60 or 70 days.

Together with the stock-pile and the inflow of coal expected from non-union regions, consumers seem to be content to take their chances. Many believe that after the first motions of a strike have been gone through and certain mental stages of excitement have been enjoyed, that the union men will be ready to face brass tacks.

Receipts of bituminous coal show a marked recession from the high point of two weeks ago, when something over 2,000 cars were received during a single week. Receipts for the week ended March 4 were 1,516 cars, divided; 1,134 cars to industrial concerns and 382 cars to retail yards.

EASTERN OHIO

An impending coal strike is apparently affording little added stimulus to production, as the ratio of output refuses to rise above the figure prevailing during the past few weeks. Output during the week ended March 4 was 385,000 net tons, or approximately 60 per cent of rated capacity, as compared with 64 per cent during the preceding week of five work-days. However, tonnage mined exceeded that of any week

since the middle of November. Association mines are operating at about the same schedule as shown for the field as a whole.

Public utilities and railroads are either well stocked for any emergency or will be within the next ten days. Likewise, retail dealers advise that their steam trade has been taken care of, and domestic consumers generally have put sufficient coal in their bins to tide them over the remainder of the winter season.

Operators and jobbers claim that more or less lethargy has overtaken demand from which it is apparent that the markets served by eastern Ohio are fast approaching the saturation point.

Barometer reports from Ohio industrial centers are very optimistic with particular reference to a spurt in steel products for automobile manufacturers who are now operating on greatly increased schedules. Railroads report consistent increases from week to week in the number of loaded cars handled through the various terminals. Likewise there is a noticeable decrease in the number of unemployed.

COLUMBUS

With the stronger probabilities of a strike looming up there is some quiet buying of steam grades for stocking purposes. Steps to avoid the impending strike have proven unavailing so far and the public is gradually coming to a realization that it is almost sure to come.

Considerable tonnage is moving. Prices, however, have not increased and a large part of the tonnage is being supplied by the mines of Kentucky and West Virginia.

Little increased buying on the part of dealers is reported. Apparently stocks are sufficient for the present and retailers are not anxious as yet. Retail prices are fairly steady at former levels. Orders are generally small as householders are only buying for the present, believing that freight rates may be reduced soon.

NORTHERN PANHANDLE

There is a little better market, although the demand is by no means as strong as it should be. Public utilities and railroads are a little more interested, but among commercial users a spirit of indifference appears to prevail. The general drift of coal is to Northern and Western markets.

DETROIT

Very little coal is being sold. The reports of impending trouble in the mine fields seem to be giving little anxiety to local buyers. There is no special effort being made to create reserves. Buyers feel that they will be able to obtain coal in sufficient quantity from the unorganized mining districts if necessary.

The retailers are practically out of the market. Their one desire seems to be to get their yards as nearly empty as possible before April 1.

Pittsburgh No. 8 1 1/2-in. lump is \$2.35, 3-in. is \$2.15, mine run \$2, nut and slack, \$1.85. West Virginia 4-in. lump is \$2.50, 2-in., \$2.25, egg, \$2, mine run, \$1.50, nut and slack, \$1.35. Hocking lump is \$2.75, egg, \$2.25, mine run, \$1.85, nut and slack, \$1.50. Smokeless lump and egg is \$3.25, mine run, \$2, nut and slack, \$1.50.

Cincinnati Gateway

Buyers Gorged with Coal; Price Increase Unlikely

Interest in Spot Market Active—Little Additional Tonnage Moving—Most Orders Filled by Non-Union Operators, Some Working Nearly at Capacity.

Active interest is being shown in the spot market but not much additional tonnage is being moved. Non-union coals are filling the majority of orders and operations are almost at capacity in some of these sections. Stocks and preparations for the strike have been well anticipated by many buyers and most of them are gorged with coal. This precludes any price increase on current offerings, and where quotations have been boosted the order falls through, for there is plenty of coal to be had and competition is too keen to permit an upward trend.

Domestic demand is fast becoming dormant with the approach of spring. Uncertainty prevails throughout the trade and all factors mark time before making contract plans.

HIGH-VOLATILE FIELDS

KANAWHA

Buyers are taking a little more steam coal but operators are precluded from entering actively into the market owing to the fact that so many of them are unable to compete with non-union costs. There are a few mines where wages have been reduced and where operations have been resumed. Retail dealers are drawing in their horns as the weather moderates. Hence slack is becoming extremely scarce and prices have stiffened.

LOGAN AND THACKER

Logan production has almost reached capacity proportions. The fear of a strike has stimulated the output to a great extent, the demand being limited to mine run and slack. The principal movement is to the Midwest and down river.

More coal is also being produced in the Thacker field, production being 125,000 tons a week. A shortage of cars is entailing a slight weekly loss. Much of the output is being moved to Western markets, with railroads also absorbing a large tonnage. Mine run is advancing a little, but not more than 10c. a ton at the most.

NORTHEASTERN KENTUCKY

There is a general increase in production but such increase as is observed is limited to the steam grades. The domestic market is very poor, dealers being unwilling to run the risk of becoming overstocked. Prices on nut and slack are almost equal to mine run.

There are now only about twelve mines on Big Sandy in idleness.

LOW-VOLATILE FIELDS

NEW RIVER AND THE GULF

Most of the New River mines are now operating on an average of two to three days a week and are finding a market in the East, although shipments of steam grades to Western markets have increased a trifle. New England demands are somewhat restricted by the textile strike although the loss of business in that respect is being offset by heavier storing on the part of other consumers of steam coal.

Although there is a fairly brisk demand for steam grades, yet Winding Gulf producers as a rule are not making anything on their output owing to the low prices prevailing. There is a fairly good market at tidewater, most of the coal so shipped being for New England and other coast markets. Prepared demand is decreasing, placing slack at a premium.

POCAHONTAS AND TUG RIVER

The Pocahontas output has increased, being in excess now of 350,000 tons per week, with a larger percentage of the coal finding its way to Western markets. New England shipments are heavy. Prices are not much in advance of those previously prevailing. The demand for prepared grades is comparatively light.

A car shortage is interfering to some extent with Tug River production. Steam coal demand is not much better than usual, but there is a brisk call for byproduct fuel. Prepared coal is not active and that is resulting in somewhat of a shortage of slack.

SOUTHEASTERN KENTUCKY

Production continues at a good rate, but has not increased to the extent expected. Some little stocking is going on, but buyers are still in control and are naming their prices in most cases. Nut and slack continues in demand, but there has been a further weakening in slack and prices are being slashed right and left.

CINCINNATI

Actual orders have not increased at all in proportion to the evidence of market interest recently shown. The possibility of a strike has passed into the certainty stage, at least among the major portion of the Kentucky and West Virginia operators in the non-union fields. This arm of the trade has been bringing pressure to bear to advance prices, but with little success. It only has shown conclusively the April 1 decision has been anticipated by buyers and that most of them are well prepared.

Contract figures are practically nil. No smokeless circular has been issued as yet. Lake prices have not been set and the whole of the trade is marking time to see which way the cat jumps.

Smokeless prices have not changed. Business on lump and egg has sagged. Practically none of the Pocahontas

mines are now back on their booked deliveries. There is enough run of mine business to hold the market steady.

Some West Virginia operators are asking an advance of 50c. a ton on their free lump coal—and few are getting it. Kentucky operators are talking of following this lead. Run of mine business on both splints and gas coals is healthy with an upward tendency. The nut and slack situation has not varied in holding the center of attraction and some dealers are now asking \$1.50 a ton, with few sales at that figure.

West

SALT LAKE CITY

Retail business is still good, but this is entirely due to weather conditions and not to the threatened strike on April 1. Most people are only buying from hand-to-mouth.

Salt Lake City dealers report the best February business for four years. Stocks are quite low in the city in spite of the possible strike. The anticipation of lower prices is having something to do with this. The unusually cold weather has had the result of improving the wholesale business from 10 to 15 per cent.

KANSAS CITY

More seasonable weather and the strike outlook have had the effect of stimulating buying. However, there was little change in the market, as some of the districts such as Illinois and Colorado are long on certain grades of coal and the chain is only as strong as the weakest link.

Everything points to a bitter struggle between the operators and miners in this district. The miners have had control for several years and the cost of production has just about put Southwestern coal out of the market. Another factor was the degrading of coal that was produced; the primary reason being the overshooting. It looks like a life and death struggle and the outcome will be watched with keen interest.

DENVER

Coal weather has forced some of the striking lignite miners to return to work at a reduction of 30 per cent in wages, not because of their own hardships so much as the fact that idle miners from other sections were ready to take their places, and did so, in many instances.

High freight rates and excessive marketing and labor costs were given by twenty leading mining companies of Colorado as the reason for the proposed 50c. reduction in daily wages of their employees at a formal hearing before the Colorado Industrial Commission. The matter has been taken under advisement.

Operators say the public is demanding cheaper coal, and margins already are so low that the only other course of meeting the public demand, at least in part, is to bring the wages of day laborers back to normal.

Bituminous steam is finding a better market, the mine price being \$2.50 and the retail figure \$6.60. Lignite steam is \$2 at the mine and \$5.45 retail. Bituminous lump is \$5 at the mine and lignite lump \$4.

News Items From Field and Trade

ALABAMA

It is reported that **Moffat Brothers**, with general offices in St. Louis, and operating mines in the Illinois field, have leased a large tract of coal land from **Henry C. Powers**, near Blocton, Bibb County, on the Mobile & Ohio. The Powers interests have a new opening located on the leased property and it is understood that the lessees will rush this development and that a large number of tenement houses will be constructed in the new camp.

The Braeard Coal Mining Co. recently opened a new mine in the Birmingham section and is pushing the development work looking to an early production in the event market conditions improve sufficiently to warrant operations.

COLORADO

Fire, believed to be of incendiary origin, destroyed the tipple of the **Jewell Coal Co.'s** mine, just north of Aguilar, in Las Animas County. Superintendent W. E. Powell reports there is no doubt the tipple was set on fire, because of trouble over employing new men.

Production in Colorado during January was 25 per cent less than during the corresponding month a year ago. January production amounted to 803,709 tons, as compared with 1,059,510 tons in January, 1921, a decrease of 255,801 tons.

The Rocky Mountain Fuel Co., Denver, has equipped its Columbine Mine with a set of Nolan cagers built by The Mining Safety Device Co.

CONNECTICUT

The estate of Annie Chapulis, a nine-year-old girl of Bridgeport, received a verdict in the Superior Court at Bridgeport recently, of \$10,137 against the **Ideal Coal Co.**, of that city. The little girl and her smaller brother were killed by a coal pocket cave-in last Thursday while at play in their yard, which adjoined the coal company's plant. The company blames the casualty on poor construction work on the part of the builders, but the decision finds that the proper anchorage was not given to the pocket.

The American Coke Co. will have a new warehouse at Hartford. The company is now taking bids for the building which will be two stories high, of brick and steel construction.

Dexter & Carpenter, Inc., New York City, has opened an office at New Haven, with Harry W. Hitchcock as manager.

The Karm Terminal Coal Co., Bridgeport, Conn., has recently started something new in coal circles around this vicinity, the establishment of a "Karm Koal Klub," which is divided up into ten classes, from one ton to ten tons. The thing will be run something after the style of the now famous "Christmas Club," and if one joins he pays at the rate of 50c. per ton per week for twenty-six weeks.

ILLINOIS

The Chicago Coal & Unloading Co. has been incorporated with capital of \$34,000 by J. E. Cornell, J. E. Cornell, Jr., Lyle Harper and Robert Berkhoff.

Announcement has been made that the **Manhattan Coal Co.** will start a shaft in the near future for a new coal mine near East Peoria.

The Illinois Coal & Coke Corporation, which now owns about 28,000 acres of coal land in Jefferson County, has plans for the sinking of a large shaft soon.

The Consolidated Coal Co. is now taking out motors, machines, telephones and other machinery from its No. 9 mine at Murphysboro. The mine was flooded by water late last year and the company has decided that it will be cheaper to abandon the mine rather than spend approximately \$100,000 in the work of reclaiming it only to get the 18 months more work which remains in the workings.

Mack Elders, general superintendent of mines No. 18 and 19 of the By-Products Coal Co., West Frankfort, has been transferred to mines owned by the company at Shelbyville.

It is understood that, effective April 1, the **St. Louis Coke & Chemical Co.** will take over and operate the Black Brier mine south of Johnson City, which has been operated for it by the Chicago, Wilmington & Franklin County Coal Co.

The Peabody Coal Co. last week bought the **Carterville & Big Muddy Mine** at Carterville. The mine has a capacity of 1,500 tons daily as it stands. The property includes 375 acres of unmined coal. For the time being it is closed down for the installation at once of a washery and a new picking table and loading booms. The mine adjoins the Federal Coal Co.'s property, another Peabody holding, but will be operated on a separate basis. M. F. Peltier, vice-president in charge of engineering, said the Peabody company does not contemplate buying any more mines in the vicinity.

Andrew Maloney, vice-president and sales manager of the C. W. & F. Coal Co., is back from a rest in Florida, where he "never let coal enter his mind." This establishes a record for long distance mental control among all weights of coal men.

Loyal rooters for the **Peabody Coal Co.** who are proudly watching their company's growth, are pointing out so that none may overlook it, the fact that the company's total production for the month of February was 829,000 tons. About one-sixth of the company's mines are shut down. It is the opinion of the company's officials that Peabody production in 1922 is leading the entire country, not excepting the Pittsburgh and the Consolidation coal companies.

INDIANA

Even the recent triple cave-in of its best mine at Princeton—the worst mine collapse Indiana has seen in years—does not discourage the **Deep Vein Coal Co.** Ridgely Rea, Chicago manager, says the company would have been forced to close up the caved-in old shaft soon anyway, and that there could be no better time for sinking the new one a mile south than right now. The total loss to the company ought not to be over \$100,000 even though the old shaft is ruined and part of the power plant and the hoisting machinery fell into the abyss while four electric locomotives and between 300 and 400 steel mine cars are underground and probably under water. The company's new shaft will be started at once, Mr. Rea said. He thinks most of the engulfed machinery can be salvaged.

KANSAS

Mines No. 18, 19 and 20 of the **Western Coal & Mining Co.** have been cleaned up and are ready for operation.

Development has reached the point of production in the **Green Valley Mining Co.**, Pleasanton. The mine is now in position to ship commercial coal.

KENTUCKY

K. U. McGuire, of the Harlan Coal Co., Louisville, has been visiting the Pineville and Harlan sections of the field.

B. P. Reed, of Louisville, who is connected with the Sackett interests who have large holdings near Pineville and on Puckett's Creek, Harlan County, was in Pineville a short time ago.

The Moss-Chamberlain Coal Co. of Covington, of which Sid Moss of the United Colliers Co., of Cincinnati, is the guiding spirit, has increased its capitalization and will acquire retail yards in Newport.

Amended articles have been filed by the **Keel Coal Co.**, Pikeville, increasing its capital stock from \$45,000 to \$75,000.

The Kentucky Court of Appeals has decided two coal cases coming up from Floyd County, the Floyd County Circuit Court decision being reversed in the case of the **Royal Elkhorn Coal Co.** against the Elk-

horn Coal Corp., which is a condemnation proceeding involving a strip of land 60 x 100 ft. A trial of the case is ordered. The case of the **Auxier Coal Co.** against **L. Blenkinsopp** and the **Big Sandy & Millers Creek Coal Co.** from Floyd County, was affirmed. The question in the case was whether under the terms of the contract there was not sufficient coal on the lease to continue mining, and the jury having held that the coal supply has been exhausted and the land might be sold the court would not disturb this judgment.

MICHIGAN

John I. Thomson, well-known coalman of Detroit, who was connected with Ayers & Lang for a number of years, is now one of the representatives, in Detroit, of the Superior Colliery Co.

D. P. Rickenbaugh purchased the coal yard of **Coppins & Leisenring** at Hudson.

NEW YORK

Noel Cunningham, formerly connected with the Coal Washing Equipment Co., has now become associated with the Hardinge Co., Inc., New York City.

J. G. Miller, Norfolk manager of Raleigh Smokeless Fuel Co., was in New York and Boston recently. **J. B. Clifton**, president of that concern, has returned from South America.

The agreement entered into between the **Coal Merchants' Association of New York** and the **International Union of Steam and Operating Engineers Local No. 20**, provides that if at any time within the present year a reduction is made in the cost of mining coal, or the freight rate on coal is reduced, and the cost of living is also reduced, so that a material reduction is to be made on the price of coal to the public a revision of the wage scale may be called for upon thirty days' notice by either party. In the event of failure to agree, arbitration must be had.

The Paul Breathing Apparatus has been officially approved by the Mines Department of the Home Office in England. It is the first foreign made apparatus which has ever received the official approval of the English Government. **The American Atmos Corp.** is the manufacturer.

OHIO

A visitor in the Cincinnati market a short time ago was **Richard Williams** of Huntington, who is the president of the Glogora Coal Co. of that city.

Quin Morton, vice-president of the Ft. Dearborn Coal Co., with headquarters at Charleston, was a recent visitor in Cincinnati.

The Wheeling & Cleveland Coal Co., Bridgeport, has been chartered with a capital of \$50,000 to mine coal in the Pittsburgh No. 8 field. Among the incorporators are **W. V. Frazier** and **A. Detrich**.

The Western Coal Co., Cincinnati, has been incorporated with Herman Everett, president, Tom Dew, vice-president and treasurer, and **W. C. McKnight**, secretary. The capitalization is \$100,000. **F. H. Dunker**, who for twenty-one years was connected with the John T. Hesser Coal Co., joins the new company as sales manager.

The Boone Coal Co., has taken offices in Cincinnati. It is organized under the Ohio laws with a capitalization of \$100,000. **M. F. McDermott** is the president, John Emslie vice-president and Wheeler Boone secretary and treasurer. It has taken over the business formerly conducted under the firm name as the Boone Coal Sales Co.

The Ebony-Diamond Coal Co. has been organized and is now located at 923 Union Central Bldg., Cincinnati. **W. J. Newhall**, formerly of the Stevenson Coal Co., is president and **Lewis J. Leibold**, secretary-treasurer.

The Ohio-Tennessee Coal Co. has opened an office in Cincinnati with **J. W. Angey** and **H. Hutton** in charge of sales. It will specialize in coals originating on the Cincinnati Southern and the L. & N.

The Houston Coal Co., of Cincinnati has filed an amended suit against the United States Government seeking to recover \$314,000 as the difference between the price allowed by the Navy for coal that had been requisitioned from April, 1920, to April, 1921. On its first attempt the case was dismissed by Judge John Weld Peck in the United States District Court

who held that the acceptance of the Government's price closed the deal. The Houston company now allege that they were forced to accept this price because of "threats made by the Secretary of the Navy through Navy officers." The nature of these threats are not set out in the petition.

OKLAHOMA

The Okmulgee County Coal Co. has been organized at Oklahoma City, for the purpose of developing extensive coal lands in Okmulgee County. The company is capitalized at \$250,000. The incorporators are Charles E. Froce, George C. Brown and Emile Hemming, all of New York.

The Oklahoma State Coal Exposition and King Koal Karnival has been organized at Henryetta, and is now operating under a state charter. The general committee has perfected its organization and is now laying plans for the second annual exposition to be held June 12 and 14.

Announcement is made that a special course of study for mine superintendents, pit-bosses, gas-men and hoisting engineers will be offered soon at the Oklahoma School of Mines, at Wilburton. These instructions will be placed within the reach of every miner in the state and the course will include purely practical problems.

PENNSYLVANIA

The Pennsylvania State Water Supply Commission has granted permission to the Anthracite Production Corporation to dredge coal in the Susquehanna River at Holtwood.

When a corporation invests money in a Pennsylvania enterprise the whole of the investment is subject to state tax, and it makes no difference whether a mortgage figured in the transaction or if the market value of the investment became less after the deal was put through, according to a decision rendered by the Dauphin County Court. In the case of the Weirton Coal Co., a West Virginia corporation, which bought coal land in Fayette County for \$2,000,000, paying \$300,000 in cash and furnishing a mortgage for \$1,700,000, the court said the company must pay the state tax on the entire \$2,000,000, or \$6,666.67. The company also argued that the coal land is not being worked and that the investment today is worth less than \$2,000,000.

Honesdale is to have another coal sales station, which will make three for the town and immediate vicinity. The new concern is headed by Chauncey Bates and associated with him is Kenneth Uglow. Modern coal chutes and office will be erected on the Delaware & Hudson track, the coal being received from the Jermyn Mines, Scranton.

Daniel Whitney, president of Whitney & Kummerer, with New York offices, has been appointed chairman of the Merchant Marine Committee of the Philadelphia Chamber of Commerce.

Hubb Bell, of the United States Testing Laboratories was the speaker at a recent semi-weekly luncheon of the New York Coal Trade Club, at the Whitehall Club.

James B. Smith, chairman of the engineering commission, E. F. Blewitt, Anthony Mayer, Joseph Reese and Thomas Kennedy have made their report on the conditions obtaining at the National Colliery, in South Scranton, which has been closed since Jan. 13. A committee from the Scranton Surface Protective Association has called on Mayor John F. Durkan to urge him to use the police power to close the mine as was done in the case of the Oxford Colliery of the Citizens Coal Co.

E. M. Keiser, has been appointed on the sales staff of the Empire Coal Mining Co., Philadelphia, to cover Harrisburg, Lancaster, Reading, Easton and intermediate Pennsylvania territory.

Coleman & Co., Inc., has been formed to market the product of the Ebensburg Coal Co. Offices will be in Philadelphia and New York. G. Dawson Coleman, Philadelphia, is president of the Ebensburg Coal Co., and also of Coleman & Co., Inc. W. B. Calkins has been retained by the operating company as consulting engineer in full charge of matters of preparation, service and tests.

A new anthracite industry was started recently by Mason & Hall Hoover, whose coal-reclaiming outfit had been stopped in the Susquehanna by ice. They erected huge posts and installed their coal screening machines on the ice. Then holes were cut and a suction dredge put to work. For

many years the men who have been dredging coal from the Susquehanna have been tied up in the winter months, losing thousands of dollars.

Iron Trade Products Co., head offices Pittsburgh, announces the appointment of Huntington Downer as manager of its iron and steel department with headquarters at Pittsburgh.

After a shutdown of five months, the Curtissville Mine of the Ford Collieries Co. near Russelton, has resumed. The mine is the biggest in the Russelton district.

W. W. Inglis, president and general manager of the Glen Alden Coal Co., underwent an operation at a Scranton hospital a short time ago.

The annual examination for certificates for mine foremen, assistant foremen and fire bosses in the Ninth Bituminous District will be held in Connellsville April 11, 12, 13 and 14. Applicants must notify the chairman in writing six days before the date set for the tests.

William A. Webb, president of the Empire Coal Mining Co., has sailed for a pleasure trip to the Bahamas. He expects to spend some time at Nassau.

A visitor in Somerset during the third week of February was Robert E. Rightmire, engineer of tests of the Consolidation Coal Co.

W. C. Dobble, general superintendent of the Jamison Coal & Coke Co., spent a few days in Greensburg, recently.

Charging that the Pennsylvania Coal Co. is removing a barrier pillar along its main gangway, endangering further use of the mine, the Suffolk Coal Co. went into court recently with a bill in equity for an injunction to restrain further removal of the pillar. A temporary injunction was granted.

The Pittsburgh Testing Laboratory announced, at its annual meeting held recently in Pittsburgh, the retirement of its president, Geo. H. Clapp, his reappointment as a member of the board of directors of the company, and the election of Colonel James Milliken to the presidency of the company.

TEXAS

The Rio Grande Coal Co., of Wilmington, Del., has been granted permit to do business in Texas, and will operate coal mines along the Texas-Mexican border. The company's headquarters will be maintained at Eagle Pass. The company has capital of \$2,500,000 and H. P. Mathis is state agent.

The Channel Fuel Co., Houston, announces that its first bunkering plant at Port Houston will be completed and in operation about the end of April. The company will conduct a ship bunkering and general wholesale coal business. The coal will be transported from the Atlantic seaboard to Houston via water and from there distributed to the various towns and cities in Texas by rail. Wharves and a bunkering plant are being constructed at Manchester, on the ship channel. The first unit of dock to be constructed will have dimensions of 250 x 82 ft. and the plant will have storage capacity of 30,000 tons.

WEST VIRGINIA

Negotiations have been closed whereby by the Jamison Coal & Coke Co. for the purchase of 700 acres of low-sulphur Pittsburgh coal land from Phillip Sessler and others, the land being near the No. 8 mine of the company at Farmington. In fact, the land extends from the No. 7 to the No. 8 plant along Buffalo Creek. No mention has been made of the consideration. It is thought the deal will be entirely consummated before the end of March.

The Public Service Commission of West Virginia is being asked by coal companies dependent upon the Appalachian Power Co. for power, to reduce the rates for the power furnished. The petition for the reduction was filed by the Atlantic Smokeless Coal Co., thirty-nine other companies joining in the petition. Within the last three years increases in the power rate, granted by the commission, makes the rate double what it used to be. Inasmuch as there has been a marked decline in all the costs entering into the production of power, coal companies feel that the power company should now be willing to agree to a reduction.

The Coal Operators Sales Co., recently incorporated, has opened offices in Huntington. The officers are: F. L. Schoew,

president; Geo. W. Coffey, vice-president; V. D. Clark, secretary-treasurer; F. W. Schoew, assistant to president in charge of sales.

Harry B. Clark, one of the well-known operators of the Fairmont field, spent the early days of March in Florida, making the trip by way of Washington.

As a result of the promotion of F. K. Day to be general manager of the new properties of the Consolidation Coal Co. in the Pocahontas field, several other promotions have been made by the company. N. F. Reeder, formerly district engineer, is district superintendent, with headquarters at Clarksburg, succeeding Mr. Day. T. A. Hunnsaker is appointed superintendent of Mine No. 38 and B. F. Harrison superintendent of Mine No. 24. All those appointed have been connected with the Consolidation for many years. Mr. Reeder has directed the engineering work in the Clarksburg district for a number of years. Although becoming district superintendent, Mr. Reeder will continue to supervise the engineering work in the district.

Ernest Chilson, general manager of the Raleigh Coal & Coke Co., was operated on late in February for gall stones.

Vice-President C. E. Hutchinson of the Hutchinson Coal Co. of Fairmont, left a short time ago for Little Rock, Ark., being accompanied by Mrs. Hutchinson.

WISCONSIN

Nothing has yet been done to salvage the 25,000 or more tons of hard coal which lie underneath the ruins of the Milwaukee Western Fuel Co.'s anthracite plant in Milwaukee. The coal is a mass of ice and debris, and will probably be out of the market for the balance of the winter.

ALBERTA

James M. Moodie, coal operator of Calgary City, has entered an action against Sir William Mackenzie, Sir Donald Mann, Patric Burns, the Rosedale Clay & Products Co., of Calgary, the Rosedale Coal Co., of Toronto, and the Trust & Guarantee Co., of Calgary. Mr. Moodie is suing on behalf of himself and other shareholders in the old Rosedale Coal & Clay Products Co. with the exception only of those shareholders who are defendants in the present suit. In 1915, when he was the largest shareholder in the old Rosedale company, Mr. Moodie claims that he transferred 32,320 shares of the capital stock to Mackenzie & Mann, or its agents, wrongfully converted these shares to its own personal use. He alleges, further, that Mackenzie & Mann formed the Rosedale Coal Co. in 1921, gained complete control of the old company and transferred all its assets to the new ones.

BRITISH COLUMBIA

OUTPUT FOR JANUARY, 1922

Vancouver Island District

Mine	Tons
Western Fuel Corp. of Canada, Ltd., Nanaimo	58,183
Canadian Collieries (D) Ltd., Comox	26,554
Extension	18,477
South Wellington	6,619
Granby Cons. M.S.&P. Co.	26,166
Nanose Wellington Collieries	8,477
Old Wellington (King & Foster)	553
Total	145,029

Nicola-Princeton District

Middleboro Collieries	6,123
Fleming Coal Co.	3,323
Coalmont Collieries	10,014
Princeton Coal & Land Co.	1,921

Total 21,381

Crow's Nest Pass District

Crow's Nest Pass Coal Co., Coal Creek	35,945
Michel	23,892
Corbin Coal & Coke Co.	4,899

Total 64,736

Grand Total 231,146

The Chu Chua Mining Syndicate is to stop the mining of coal pending the installation of proper handling and dressing machinery, upon which the company will spend \$200,000. In the meantime the limits of the coal seams will be explored with a diamond drill. Up to now the syndicate has expended some \$150,000 on the development and equipment of the mine.

The construction of a forty-five mile railroad to open up a coal field in the Morice River Region, northern British Columbia, is being asked of the Dominion Government by a deputation of residents of Prince Rupert and the districts adjacent. Such transportation facilities, according to a statement made by the **Prince Rupert Coalfields Ltd.**, would tap a proven reserve of 54,000,000 tons of high-grade bituminous coal. The railway also would give the operators of the Betty Mine connection with the Grand Trunk Pacific. Thus the project would assure a continuous supply of fuel to Prince Rupert and users throughout the north country. Not only this but it would make possible the development of a substantial bunker trade at the port of Prince Rupert.

WASHINGTON, D. C.

The American Federation of Labor in a statement advocating the manufacture of light wines and beer states that prohibition has cut off the consumption of 50,000 cars of coal annually by breweries.

A bill regulating the discharge of smoke from chimneys in the District of Columbia has been introduced in the Senate by Senator Ball, Delaware, chairman of the Senate District Committee. The bill would prevent the emission of smoke of a degree of darkness or cinders equal to No. 3 of Rigelman's smoke chart as published by the Bureau of Mines for more than one minute in any 15 minutes from any smoke stack or chimney in the District.

Director Klein of the Bureau of Foreign and Domestic Commerce says that the following coal interests are co-operating with the bureau in its trade promotion work: National Coal Association; American Wholesale Coal Association and the National Retail Coal Merchants' Association.

The Internal Revenue Bureau has appointed **F. L. Clements** as chief of the Coal Valuation Section of the Natural Resources Division of the Income Tax Unit, succeeding **A. W. Gaumer**, who has been appointed a member of the committee on Appeals and Review of the Revenue Bureau.

The President has signed, thereby making it a law, the act passed by Congress authorizing agricultural entries on coal lands in Alaska.

In a Senate debate Senator Heflin, Alabama, said the operation of the Muscle Shoals, Ala., nitrate plant would save the consumption of hundreds of millions of tons of coal.

Traffic News

The Traffic Service Bureau of Utah has filed a brief against the O. S. L. R.R. in behalf of the coal mine operators protesting the action of the railroad company in its alleged discrimination in favor of Wyoming mines.

Application for permission to refinance maturities falling due April 1 has been made to the I. C. C. by the **Erie Railroad Co.**

At the request of the attorneys of coal operators and representatives of various chambers of commerce in Ohio, the proposed hearing on the reasonableness of Ohio freight rates, which was scheduled to start before the Ohio Utilities Commission Feb. 28, has been postponed until April 5. No objection to the continuance was raised by the carriers.

Freight rates from Utah and Wyoming coal fields to Nevada points have been declared too high by the I.C.C., and the carriers are ordered to reduce them by amounts ranging 10 to 20 per cent.

In the complaint of the **City of Detroit**, an I. C. C. examiner recommends that the rates on bituminous coal from Holden and other West Virginia points on the C. & O. to Toledo for trans-shipment via water to Detroit are not unreasonable.

In the complaint of the **Milwaukee Western Fuel Co.**, an examiner recommends that the rate on coal from Princess, Kilgore and Norton Branch, Ky., on the Ashland Coal & Iron Ry., to Toledo, for trans-shipment by water, was unreasonable during Federal control.

By virtue of an agreement between the parties in interest, the I. C. C. has dismissed the case of **Theodore A. Leber** versus the **P. & E. Railway Co.**, Director General as agent, et al. This action, Docket No. 12703, related to rates on anthracite from St. Clair, Pa., to Port Reading, N. J.

In the complaint of the **Cleveland Coal Co.**, the I. C. C. decides that the rates on

bituminous coal from South Rivesville, W. Va., to New York and New Jersey points are not unreasonable.

In the complaint of **J. L. Shalutz**, an I. C. C. examiner recommends that the rates on coal from the anthracite region of eastern Pennsylvania to Skaneateles, Rose Hill and Marcellus, N. Y., are reasonable.

In a complaint to the I. C. C. the **Kanawha Black Band Coal Co.** alleges unreasonable rates on coal from its mines to the Kanawha Central Ry., to various destinations.

The C. & O. Ry. has asked the commission to dismiss the complaint of the **Nelson Fuel Co.**, which asks for joint through rates on coal on the New River district basis from mines on the Greenbrier & Eastern. The railroad says these rates are already on a depressed level because the three-line haul is more costly than the single-line haul, because the service performed is greater and because application of the district rate is not necessary to place the Nelson Fuel Co. in fair competition with mines from which that rate applies.

The **Denver & Salt Lake R.R.** has requested of the I. C. C. a 15-year loan of \$6,500,000 to construct a tunnel through the Continental Divide, to make the operation at this high altitude less expensive and troublesome and to make large coal deposits accessible.

A bill placing railroad construction, including coal docks, under the authority of the I. C. C. has been introduced in the House by Representative Beck, Wisconsin.

In the complaint of the **United Verde Extension Mining Co.**, the I. C. C. has decided that the rates on coal from Dawson, N. M., to Clarkdale and Jerome, Ariz., are unreasonable.

The **Clay County Coal Operators' Association**, in a brief before the I. C. C., asks rates on coal from mines on the Cumberland & Manchester R.R. which are no higher than those from mines in the Jellico, Ky., group on the L. & N. The L. & N. in a brief says it should not be required to absorb the charges of the Cumberland & Manchester out of an already low rate.

The **American Steel & Wire Co.** has been authorized to intervene in the case of the **Lackawanna Steel Co.**, relating to rates on coal from the Reynoldsville, Pittsburgh, Connellsburg and related coal fields and on coke from the same districts to Buffalo and vicinity.

The proposed adjustment of rate differentials between producing points in Illinois and Indiana and points north and west of those coal fields will be held up indefinitely. This was the outcome of a meeting last week in Chicago of the railroads' coal and coke committee with men from many shipping and receiving organizations. The adjustments were to have been made by the carriers acting under an opinion of the I. C. C. accompanying Ex-parte 74 issued in August, 1920. These corrections were never made because of the various rate protests from Illinois which have been before the commission most of the time since Ex-parte 74 was issued. In last week's conference at Chicago the shippers argued that no adjustments should be made now because the I. C. C. is expected soon to make its decision on coal freight rates in general.

The **Fifth and Ninth Illinois Districts Coal Bureau** has requested the I. C. C. to conduct a general investigation into all coal rates from mines in western Kentucky, Indiana, Illinois, Iowa, Kansas, Missouri, Arkansas, Colorado and Wyoming, and from the docks to all points in Illinois, Wisconsin, Michigan, Iowa, Minnesota, the Dakotas, Missouri, Kansas, Nebraska and Colorado.

Association Activities

Northern West Virginia Coal Operators' Association

The position of the association with reference to any change in mining rates is admirably set forth in a statement issued by President A. Little White, in which he says, "The coal business is going to improve when it has become adjusted to after-the-war conditions. We might as well all of us understand that a readjustment is coming and get in line with it. It is a national condition that we must take into account."

"With railroad freight rates imposing a handicap on our section in competition with other districts which mine a similar grade of coal, we are now in a position where our competitors are able to undersell us in the open market. Our mines are now running far below their normal capacity and it is safe to say that 90 per cent of the coal coming out of Northern West Virginia is on contracts which expire March 31.

"In considering the matter of a wage scale for the coming year, the association has faced the exact facts as we know them. When that scale is given out, it will provide for the highest wages that can be paid and still leave our field in a position to sell coal in competition with other fields."

Obituary

Alfred T. Grayson, 80 years old, died recently at the Odd Fellows' Home at Manhattan, Kan. Deceased was one of the pioneers of the Kansas coal fields, having had charge of the sinking of three mines at Leavenworth. For eleven years he was superintendent of the state mine at Lansing.

Benjamin C. Masten, aged 32 years, Washington, Pa., war veteran and manager of the Producers' Coal Corporation, was killed recently when the automobile in which he was riding was struck by a street car at Meadowlands, near Washington, Pa.

News of the death of **E. S. Hutchinson**, one of the pioneers of the Pocahontas field of West Virginia, at his late home in Newton, Bucks County, Pa., has been received. He came to the Pocahontas field in 1889 as general manager of the Lick Branch Mine of the Norfolk Coal & Coke Co.

Samuel T. Brush, one of the first coal operators in the southern Illinois field, died at his home at Boulder, Col., recently at the age of 80 years. He organized the St. Louis & Big Muddy Coal Co. His sales agent in St. Louis, Captain Pavey, passed away last week.

Cyrus Garnsey, whose death occurred at Seneca Falls, N. Y., on Sunday, Feb. 19, 1922, was born at Clifton Park, N. Y., on Sept. 28, 1827. He is survived by Cyrus Garnsey, Jr., Hamilton Garnsey and one daughter, Mrs. Lucy G. Russell. Cyrus Garnsey, Jr., was Assistant Fuel Administrator during the war.

Coming Meetings

New England Coal Dealers' Association will hold its annual meeting March 22 and 23 at Springfield, Mass. President, W. A. Clark, Milk St., Boston, Mass.

Society of Industrial Engineers will hold its national spring convention at the Hotel Statler, Detroit, Mich., April 26-28.

National Association of Purchasing Agents will hold its seventh annual convention at Exposition Park, Rochester, N. Y., May 13-20. Secretary, S. C. McLeod, 130 W. 42nd St., New York City.

National Foreign Trade Council will hold its annual meeting May 10-12 at Philadelphia, Pa.

Mining Society of Nova Scotia will hold its annual meeting May 15, at Sydney, N. S., Canada. Secretary, E. C. Hanrahan, Sydney, N. S.

American Society for Testing Materials will hold its twenty-fifth annual meeting June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at the Chalfonte-Haddon Hall Hotel. Assistant treasurer, J. K. Rittenhouse, Engineers' Club Bldg., Philadelphia, Pa.

The twenty-seventh annual convention of the **Illinois and Wisconsin Retail Coal Dealers' Association** will be held at the Hotel Highland, Delavan Lake, Delavan, Wis., June 13, 14, 15. Secretary I. L. Runyan, Chicago, Ill.

American Society of Mechanical Engineers will hold its annual meeting May 8 to 10 at Atlanta, Ga. Secretary, C. W. Rice, 29 West 39th St., New York City.

Chicago Coal Merchants' Association will hold its annual meeting April 11 at Chicago, Ill. Secretary, N. H. Kendall, Plymouth Building, Chicago, Ill.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 26 and 27 at the Sevierin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Fidelity Trust Bldg., Indianapolis, Ind.